

## Medical Societies.

### ROYAL SOCIETY OF MEDICINE.

#### SECTIONS OF TROPICAL MEDICINE AND PATHOLOGY.

##### TROPICAL DISEASES ARISING FROM DIETETIC DEFICIENCY.

A COMBINED meeting of these Sections was held on Jan. 7th, when the chair was occupied by Prof. J. B. CHRISTOPHERSON, President of the Section of Tropical Medicine.

Prof. J. W. B. MAGAW said there were three main forms of dietetic deficiency in the tropics: first, shortage of food as a whole; secondly, shortage of available proteins; thirdly, shortage of vitamins. Many millions of the inhabitants of tropical countries lived on the borderline of starvation, and when harvests were bad many suffered from actual starvation. The problem, in a broad way, therefore became one of adjustment of the population to the food supply. It should be emphasised that research workers could do little to improve the conditions of human existence so long as these efforts were nullified by a progressive increase in population. The well-being of the human race must depend on four supports: (1) the production of food and other necessities; (2) the control of reproduction; (3) the prevention of disease; (4) the maintenance of security. Most of the people in the tropics lived short of proteins. Mackay had found but little deficiency of vitamins in the diets which he investigated, and had considered that if there were adequate protein in the food the vitamins would take care of themselves to such an extent that their apparent shortage would not be a serious problem. The subject of vitamin B deficiency was sufficient to fill an evening's discussion. He did not agree with those workers who said that beri-beri was caused by a deficiency in the diet of vitamin B, or that all other theories of the causation of that disease had died a natural death. Some workers denied that deficiency could account for outbreaks of the disease which they had studied. Many believed there was a factor in addition to avitaminosis. In the Far East beri-beri was strikingly associated with a diet of over-milled rice, and peripheral neuritis was a notable feature. Fowls and other winged creatures developed this neuritis, and it could be cured or prevented by giving vitamin B. Beri-beri in humans living on over-milled rice could be cured or controlled by the substitution of par-boiled rice. Attempts had been made to reproduce beri-beri in human beings, using volunteers from among the jail population in the Philippines. These experiments showed that a monotonous diet which was poor in calories, in available proteins and in vitamin B, caused a vitamin disturbance which was suggestive of beri-beri. It was found difficult to devise a diet lacking in vitamin B, but satisfactory in all other ways. There was really very little reliable evidence of a uniform association between human beri-beri and vitamin deficiency. Prof. Magaw went on to describe several outbreaks of epidemic dropsy. Two authorities were unable to exclude this disease from the beri-beri group. It often appeared as an explosive outbreak among people who were living on the same diet as usual; there was no reason for regarding this disease as an avitaminosis. Beri-beri was a name which had been used for many years to designate certain disease manifestations, mostly associated with the use of a rice which had been stored for a long time after manufacture. There might be two or more diseases in the beri-beri group, but they had not yet been differentiated with certainty. Probably one of those diseases was caused by a poison which was formed in rice stored in damp and hot rooms. He admitted that some of the diseases entitled to be included in the

group were due to a deficiency, chiefly of vitamin B. An attempt ought to be made to differentiate the diseases in the group; one should not be satisfied with a hypothesis which invoked several causes for a single disease. He did not accept the idea of endocrine deficiency as a satisfactory explanation of any disease. If endocrine glands were deficient, the question to be answered was why they had become disordered. Probably the endocrine deficiency was an effect, not a cause. Practitioners need not be depressed because causation of beri-beri was still obscure; their duty was clear—namely, to cut out rice from the diet, so ensuring that poisons residing in rice were eliminated; and to ensure that the diet was nourishing and that it included vitamin B.

Dr. G. MARSHALL FINDLAY said it was possible to produce various types of inanition. One was the quantitative type, in which all the known factors were present in the diet, in complete or incomplete amounts. Qualitative deficiencies, however, were the most important, and the lack of certain amino-acids was most important of all. The aromatic amino-acids seemed to be essential in the diet. In the course of a review of our present knowledge, Dr. Findlay said that if rats were placed on a complete diet, except that the sole source of protein was represented by dried egg white, they developed dermatitis, the hair fell out, and they had a kangaroo-like attitude when they walked. The pathological changes were identical with those seen in children with "pink disease," but never older than  $3\frac{1}{2}$  years. The condition known as hunger oedema, seen, for instance, in Russia in 1921, had never been produced in animals, but was probably due to protein deficiency. Epidemic dropsy seemed to occur only in rice-eaters, whereas beri-beri often occurred in those who had never eaten rice, but suffered from a deficiency of vitamin B<sub>1</sub>. In association with epidemic dropsy there was often an acute exanthematous rash, and also glaucoma, which had not been described in association with true beri-beri. The changes in an early condition of pellagra, said Dr. Findlay, were described as a degeneration of the cells of the central nervous system, and a collection of lipid pigment in the cells; but the degenerative changes in the cord were not usually found in human pellagra until the condition was very marked.

##### Discussion.

Dr. H. B. DAY said that pellagra bore the same relation to the consumption of maize as beri-beri did to the consumption of rice. No one had succeeded in transmitting pellagra. One of its earliest symptoms was diarrhoea, but unless there was a complicating infection there was nothing characteristic about the stools. The cause of pellagra, he thought, was something which was related to nutrition, chiefly of the ectodermal structures. The problem in man and in animals was not the same. It had been suggested that with a larger protein consumption, more vitamin B was required than when the protein was cut down to a minimum. That might explain the vagaries met with in the condition.

Dr. G. W. BRAY gave the meeting his experiences in the mandated islands of the Pacific bordering on New Guinea. Here infantile beri-beri was very rife, and the mortality among the newly born was about 50 per cent. The native population did not eat rice, but lived on fish and native fruits. Fermented liquors were denied them. The cases were formerly diagnosed as stomach trouble, marasmus, bronchopneumonia, &c. Death usually took place from the ninth to the twelfth week after birth, the death-rate being least when the rainfall was heaviest. Infants, apparently well, would suddenly vomit, scream, and die within five minutes. In most of the cases the illness did not last longer than 24 hours. The yeast found in the sap of the coconut palm was found to cure this condition, and the infantile mortality, which formerly was 400 per 1000, was now about 70, or little more than in England. It was the custom of the mothers at the time of the birth to eat very little but to drink a good deal of sugared water. Neither

white flour nor polished rice was allowed to be sold now, and the drinking of so much sugar-water was discouraged.

Dr. TERTIUS CLARKE said that the disease he encountered in Malaya was true beri-beri, but that in India was not. When par-boiled rice was substituted for the polished kind the disease ceased.

Dr. W. R. AYKROYD spoke of beri-beri among the inhabitants of Newfoundland and Labrador, who were living on staple white flour. The beri-beri seen there was associated with polyneuritis, myocarditis, and occasionally with œdema, and it occurred in people who were living in conditions of marked malnutrition—people who for months were confined practically to refined white-flour bread, with a small addition of salt meat or fish and some molasses. When a better diet was available the cases decreased in number. In these regions there seemed to be a close relation of the disease to absence or deficiency of vitamin B 1.

Dr. HUGH STANNUS suggested that besides some deficiency there was operative some active factor in the diseases such as beri-beri, though its action was masked. The onset of rickets could be materially helped by giving large quantities of oatmeal. He would like to know whether various species of animals made use of different amino-acids, or were they common to all species?

Dr. KINGSTON BARTON asked why the infants in Polynesia, who continued to be breast-fed for many months, failed so soon. Owing to the continuation of practical starvation of the mother probably her milk was at fault.

Dr. G. W. THEOBALD said he came from Siam, where it was impossible to knock the patient off rice. His patients were pregnant women, who in every case had beri-beri of the dry type. Their diet was not altered, except to substitute unpolished for polished rice, and they got well. He had seen some of Colonel McCarrison's pigeons, and he did not see much difference between the polyneuritis of those pigeons and the dry beri-beri of his own patients. The result of the white man's incursion into Siam was that rice was polished solely for the European market. Three years ago a congress under the auspices of the League of Nations was held in Singapore to try to stop this polishing, but the Government opposed, saying that unless the rice were polished there would be no market for it in London. Therefore the industry was still flourishing.

#### Replies.

Prof. MAGAW, in reply, said it would not be a surprise to learn that a toxin was excreted in the mother's milk in the cases referred to by Dr. Bray. Glaucoma occurred in epidemic dropsy, but not in beri-beri, though the French called attention to a scintillation of the eyes and a dimness of vision associated with the latter disease. Epidemic dropsy was usually explosive, but not always. It was always difficult to get a sample of the actual rice implicated in an outbreak, for when inquiry was made the dealer took fright and disposed of the rice elsewhere. In the larger proportion of cases pellagra occurred among maize-eaters. The behaviour of beri-beri suggested the activity of an irritant toxin which entered the body through the gastro-intestinal mucous membrane.

Dr. FINDLAY, in reply, said that when scurvy was experimentally produced in utero the mother might not be suffering from the disease; and he thought it was safer in the conditions now being discussed to assume there was a deficiency which was affecting the mother to a slight extent, but was shown definitely in the infants. The dimness of vision, &c., in beri-beri suggested deficiency in vitamin A, since such deficiency caused night-blindness and other conditions of the kind. There was much evidence that absence of vitamin B 1 interfered with the metabolism of the organism in a number of ways.

The CHAIRMAN said his own experience of tropical disease was in the Soudan, where there was practically no pellagra at all, though in the contiguous country of Egypt it was one of the most serious of the national diseases. In the Soudan millet was the staple food,

while in Egypt the food was maize. Much still remained to be learned concerning both pellagra and beri-beri, and when India and Egypt attained to the larger measure of independence at which they were striving he hoped the researches so carefully made would be continued, to the benefit of their population.

## PATHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

A MEETING was held on Jan. 3rd and 4th in the Bland-Sutton Institute at the Middlesex Hospital, Prof. J. McINTOSH in the chair.

F. W. Andrewes (London) pointed out that the immediately preceding cultural conditions might greatly influence the agglutinability of hæmolytic streptococci.—C. E. Dukes (London) gave an account of several cases of polyposis intestini with their family trees, showing that the condition is familial, inherited apparently as a mendelian dominant, more frequent in males than females, and ending in carcinoma in two-thirds of the cases unless prophylactic excision of the large bowel has been done.—J. H. Teacher (Glasgow) showed a specimen of carcinoma of the gall-bladder from which about 100 secondaries had been implanted in the mucosa of the intestine though embolic dissemination with specific localisation could not be excluded; there was widespread lymphatic metastasis.—E. H. Kettle (London) described a case which broke the rule that chronic ulcer of the duodenum never leads to cancer.—W. Cramer (London) had tried a great variety of experiments to look for evidence that mouse carcinoma or sarcoma was transmissible without living cells; some of the results, especially with sarcoma, were suggestive, but none conclusive that this might sometimes happen.—T. Lumsden (London) had had an American strain of mice (which in Buffalo develop carcinoma of breast in 94 per cent. of the females), without obtaining any such excess of tumours; he described also a number of observations on the subcutaneous nematodes of mice.—Helen Chambers and Gladys Scott (London) summarised their experience of many years in the propagation of the Jensen rat sarcoma; the young born of animals in which the tumour had spontaneously regressed were more resistant than usual.—F. C. Happold (Leeds) discussed the correlation of the oxidation of certain phenols and dimethylparaphenylenediamine by certain bacteria.—J. B. Duguid, Marjorie Duggan, and J. Gough (Cardiff) had endeavoured to produce arterial degeneration by giving excessive quantities of irradiated ergosterol by the mouth. Little effect was obtained in rabbits, more in cats; in rats, abundant calcification was obtained if they were fed on a vitamin-free diet, with or without the addition of cod-liver oil and marmite, but not if they received an ordinary mixed diet. Calcification was preceded by degeneration. Cramer and Cameron had obtained similar results.—M. J. Stewart (Leeds) found that the "curious bodies" of human pulmonary asbestosis could be produced in guinea-pigs by the subcutaneous inoculation of asbestos dust, the fibres acquiring the characteristic nodular accretions.—S. L. Cummins and A. F. Sladden (Cardiff) showed the importance of estimating the amount of silica in the lungs of coal-miners suffering from pulmonary fibrosis.—J. G. Greenfield (London) described the changes in the central nervous system in two cases of encephalomyelitis following mild febrile illness ("influenza") one fatal after four days from broncho-pneumonia, the other after seven weeks from cystitis. Perivascular demyelination was very marked.—J. McIntosh (London) maintained that the characteristic histological change in vaccinal encephalitis (rabbits) was an endothelial, not a lymphocytic, reaction, and that in this way the disease differed from post-vaccinal encephalitis in man. Hurst said that his experience in monkeys bore this out.—W. M.