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DEFICIENCY DISEASES IN THE BUKOBA DISTRICT, TANGANYIKA TERRITORY.

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Bukoba District is situated in the North-West of Tanganyika Territory, having Uganda Protectorate on its northern border, Belgian Mandated Territory in the West, Victoria Nyanza in the East and the District of Biharamulo in the South. The township of Bukoba is at lake level, 3,709 feet above the sea, but most settlements and villages are on the plateau above the lake. The native population was given in the 1931 census as being 277,201, and is divided between eight sultanates.

The work of the people is agricultural, being concerned with the growing of coffee and bananas. The coffee crop is the economic one and the banana forms the staple diet of the people. It is customary in the District to grow coffee and bananas together, the bananas offering food, beer, shelter to the natives and manure to the coffee. Game is plentiful in parts, but far removed from centres of cultivation. Ordinances prohibit the killing of game by natives, and as a result, the population is deprived of a natural meat supply. Slaughter oxen are imported from Mwanza, a distance of 113 miles across the Lake, but the number (700 per month) is entirely inadequate. Milch cows have always been scarce and now that rinderpest has stricken the herds, milk is almost unobtainable.

DIET OF THE NATIVE.

I have stated that the banana is the main article of food. This is augmented when possible, and the following is a description of the dietary. In the morning coffee is chewed. The berries are reaped green, placed unshelled in water and then boiled for some hours. The boiled berries are then spread on a grass mat which is suspended over a fire and are smoked. At midday and in the evening bananas are eaten. The banana is boiled in water. Ground nuts and

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beans are added in small quantities. In a few sultanates sweet potatoes are eaten. Fish, meat and milk are consumed when obtainable, but the opportunities are rare and only offered to a favoured few.

Signs and Symptoms of Deficiency Diseases in Bukoba District.

Night blindness is complained of, ulceration of the cornea occurs and pigmentation of the conjunctivae is common. Chronic enlargement of the parotid glands is to be seen and is deserving of explanation. Enlargement of these glands in syphilis, tuberculosis, actinomycosis and Mikulicz'-disease, is well known, but it is also stated to occur as a result of avitaminosis and non-specific infection. Its occurrence in avitaminosis has been reported and the following statement made :

" The fact that the parotid glands are hypertrophied in some cases of pellagra suggests that an attempt is being made to increase the output of ptyalin and that there is a compensatory hypertrophy to make up for a deficiency of carbohydrate-splitting ferments elsewhere in the body."

This is undoubtedly attractive, but I believe that the cause of the chronic enlargement is to be found in the atrophy of mucus-secreting cells which takes place in vitamin A deficiency and exposure to infection. Sialography, as described by Payne (1931) is worthy of trial as a diagnostic and therapeutic measure for this condition. It is of interest to the practitioner working in an area where X-rays form part of the armamentarium. Lipiodol, $\frac{1}{2}$ to 1 c.c., is injected into Stenson's duct and a lateral radiogram is immediately taken with the head of the patient in full extension. Iodine solution, saline or 1 per cent. mercurochrome may be used in treatment.

Examination of the tongue shows that it is tremulous and glazed. A characteristic appearance is one where the dorsum is somewhat coated and around the tongue is a red margin with here and there a small ulcer. Soreness is complained of ; and in children inflammation appears to select the circumvallate papillae of the base. Epithelium is lost. The teeth show little abnormal, but the mucous membranes are unhealthy and the gingival margins exude pus. The palate shows a faint pigmentation as if jaundiced. Dermatitis is seen, and in the early case the skin is slightly swollen, and the seat of burning and itching. A butterfly patch over the nose and malar regions is present. The necklace appearance, first observed by Casàl, is to be seen rarely. Hair is lost and this can be seen particularly at the outer ends of the eyebrows. The nails are cracked and appear brittle. In the later stages the skin is thick and rough, especially on the elbows and back of hands. In many cases, however, the distribution of altered skin is variable, the patient becomes dull, stupid, and subject to dementia. Intractable diarrhoea, emaciation and death in advanced cases occur. Postmortem examination reveals a profound atrophy of the intestinal mucous membranes.

The condition is common in the district and presents a picture so typical that I have little hesitation in naming it pellagra. If the triad of dermatitis, diarrhoea and dementia is conclusive evidence of this disease, then there need be no hesitation. The condition is recognisable, however, long before its terminal stage, and the threshold state is the important one.

The people seem peculiarly open to infection, acute parotitis sweeps the villages, pneumonias are common, pulmonary tuberculosis is not rare and I fear that full investigation would show great prevalence. Alimentary and genito-urinary disease is widespread and I suggest that much of the disease is due to food inbalance. The destruction of epithelial surfaces associated with deficiency of vitamin A exposes the population to much infection and the manifestations of pellagra disturb the district and account for many lives.

Medico Legal Significance.

It should be remembered that a patient suffering from pellagra is liable to mental change. Epileptiform seizures, suicide, melancholia, maniacal outbursts are reported. The occurrence of insanity in a pellagrinous people is given as being up to 15 per cent. The accuracy of this figure is difficult to assess, but in any case, that a large number of natives are dangerous to themselves and to others, that many more are subject to attacks of melancholia and irritability, is of some importance to this district and its Administrators. After some years' work in Bukoba I have formed the opinion that much of the crime is periodic. This is difficult to prove as figures are not readily obtainable. Judicial preliminary enquiries and inquests show an increase in June, July and August, with an outbreak in December and January. That crime is periodic here is admitted by most, but the explanation offered is the one of excessive beer drinking. In answer I suggest that beer may be obtained by the native throughout the year, and that much serious periodic crime is due to the mental storms of pellagra. This is of significance to a medical officer and at his examinations of accused persons should be borne in mind. The following is an illustrative case :—

Prisoner 5872, Kaganda, was placed under observation, a report being requested as to his mental condition. He showed conjunctival pigmentation, tongue tremor with thickened skin over knees and elbows. He was quiet, docile, and after 15 days it was decided that he was mentally able to proceed to trial. He was sentenced to 6 months' imprisonment and considered as being fit for light labour. A few days after sentence he was admitted to hospital as suffering from debility. He had changed in appearance and had become mentally and physically enfeebled. His tongue showed increased tremor, his knee jerks were exaggerated. Diarrhoea was marked and the patient lay in a state of stupor and was so tolerant of flies that he had to be nursed under a mosquito net. He was much improved after one month in hospital, treatment consisting of diet, cod liver oil and malt.

The occurrence of the disease is to be expected in the prisons whose population is drawn from the pellagrinous area. Since 1928 I have encouraged the growing of vegetables, and prisoners are issued with a daily ration of spinach. Ten deaths have been recorded as occurring in the prison population in the past 5 years and in four of these, debility and exaggerated bowel movement were noticed.

TREATMENT.

Treatment in early cases is satisfactory but in late cases is of little avail. The diet should have a basis of milk, meat, eggs, green vegetables and fruit. Cod liver oil and malt is of value. Dilute hydrochloric acid is advocated and up to 1 oz. of brewers' yeast daily appears to offer relief. I have experience of the use of a balanced diet and cod liver oil and malt only, but most writers agree that brewers' yeast should be given. A hypercalcaemia is reported as occurring in pellagra and it would be of interest to observe the result of sodium phosphate or thiosulphate medication.

Administrators should be advised that the food of local natives is deficient and steps taken to ensure that a balanced diet is available. Hospital dispensaries and tribal dressing stations should be issued with cod liver oil and malt or brewers' yeast. The cost of this issue may be prohibitive, but enquiry should produce a cheap substitute.

SUMMARY.

A condition believed to be due to food deficiency is described as occurring in the Bukoba District of Tanganyika Territory.

The chief features of the disease are considered pellagrinous.

The medico-legal importance of pellagra is stressed.

It is suggested that if steps are not taken to prevent and treat the disease, loss of life, labour and money will continue.

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