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SOME OBSERVATIONS ON BRAZILIAN BERIBERI.

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Recently in conversation with a Brazilian doctor, Inspector of Ports for his Government, I asked him regarding the etiology of beriberi. He replied that the disease is due to the deficiency or absence of vitamins in diet, and especially in rice, so much so that steps were being taken to prohibit the importation of polished rice into the country. Questioned as to the disease known as beriberi in Matto Grosso and the Amazons, he replied that it is quite a different disease, being a "quinine-resisting form of paludism." Whether or not this represents the official theory of the Brazilian authorities I have not been able to ascertain. My own observations, however, and information obtained from various other sources, may be of sufficient interest as to merit consideration from those whose special work it is to investigate the etiology of such diseases.

I made special enquiries regarding the disease in the towns and districts of Corumba, and Cuyaba, the capital of the province. A Brazilian colleague, Dr. HORACIO HUIQUE, Medical Officer of the Military Hospital

of Corumba, sent me detailed information regarding the disease in his district :—

“Geographical distribution : the city of Corumba and neighbouring districts extending towards the Amazons and Bolivia.

“Locality : it occurs in low-lying districts, near lagoons, and along the course of and in the neighbourhood of rivers.

“The soil : the nature of the soil varies, but it is always in places liable to periodical inundations, or in places in the neighbourhood of swamps, even although not liable to inundation.

“The season of the year : mostly during the summer months, from November till March.

“The age and sex of patients : cases seen have been only in men, their ages being from 20 to 45.

“The occupation of the patients : they have been soldiers and sailors—soldiers who lived and fed in the barracks and were attacked there ; sailors of the flotilla at Ladosio, who were attacked especially when living on board ship anchored at the riverside, it being necessary on more than one occasion to disembark the whole ship's company in order to fight effectually the epidemic.

“Conditions predisposing to the disease : overcrowding and poverty.

“Symptoms : generally the disease begins with fever ; but the most constant initial symptoms mentioned by all the patients are pains in the lower limbs, numbness and powerlessness of the legs, and fatigue on the slightest exertion. There may be gastric disturbances. The symptoms of dropsy, loss of voice, and paralysis may appear very quickly, even within forty-eight hours in grave cases, or may develop more slowly in milder cases.

“Transmission of the disease : as regards insects, the only insect that seems constantly found in places attacked by beriberi is the mosquito *Anopheles*.

“The common food : rice, either imported or native grown and prepared, wheaten flour, flour of mandioca, meat (fresh or dried), and beans.

“Endemic districts : Corumba, Miranda, and many other special localities.

“The effect of change of climate : near Corumba, at a distance of twelve miles, is Urucum, which is high, bracing, and very dry, and the chief resort for beriberi patients from Corumba. The south of the State

and also the plateau of Campo Grande to the north-east have excellent climates for the cure of beriberi. It is worthy of note that all the places considered suitable for the cure of beriberi are at higher altitudes, and have dry bracing climates, the soil is dry and never subject to inundations, distant from swamps and from rivers with swampy margins."—(Report of Dr. HORACIO HUIQUE, Corumba.)

A beriberi patient from Matto Grosso gave me the following history. In 1895-96 he was living in Corumba, employed in a large business house in which there were thirteen employees in all. Ten of them were attacked with beriberi—at first two men, then one by one, until within a month ten of them had sickened. The chief symptoms were dropsy and paralysis. Some of the patients had to be carried on board the river-boats, others were able to walk down with the help of two sticks. They all went to higher altitudes and returned cured within two months, all except one who went to his home at Miranda, where beriberi is endemic, and died.

Their diet previous to their illness had consisted of meat, fowl, milk, white bread, vegetables, salads, fruit, native-grown rice, and maize. They drank the water of the river. The patients were all seen by the Brazilian doctor, Dr. ALEXANDER VALLE, who diagnosed the disease as beriberi.

The patient who related this story, Antonio P. Carvalho, had, after twenty years, a second attack of beriberi, and came under my care. Forty years old, a native of Cayuba, later resident at Corumba, where he had his first attack of beriberi, and now resident in the south-eastern corner of the State towards the basin of the Upper Parana, he fell ill on the 20th June, 1915, but was not seen by me until the beginning of August. His first symptoms were those of fever, and pains in the joints and epigastrium, numbness of the hands and feet, and swelling of the legs. Realising that he was seriously ill, he resolved to undertake the journey to the nearest Brazilian town of Punta Rora, and so, on the third day of his illness, he made his men carry him on a stretcher some fifteen miles to the house of a friend on the way to the town. Even this short journey was almost too much for him, and he had to remain there some three weeks. The fever lasted ten days in all, but the weakness and swelling continued. His legs were completely paralysed. He gradually

lost his voice, at first being unable to articulate the sounds of *r* and *l*, then gradually becoming completely aphonic. This aphonia lasted some eight or nine days and then his voice began to recover. He began to feel his feet and to be able to move them. He had become exceedingly weak and very anæmic. The improvement in his condition began from the time he left his friend's house, on the 16th July, and by the time he had covered the ninety miles to reach the town on the hills he was feeling remarkably well. Wishing, however, to make absolutely sure of a complete cure, he came on, 210 miles farther, to my place, arriving in a bullock cart on the 9th of August, fifty days after the beginning of his disease.

The patient was extremely emaciated and very anæmic. The left leg had begun to recover, and there was a certain amount of control over the foot. The knee reflex was completely absent. The right leg was completely paralysed and the knee-jerk absent. There was considerable numbness of the legs and hands. On several occasions, when trying to lift a glass to drink, he let it slip from his fingers. On one occasion, when he was feeling very much improved, in the absence of his servant he tried to take his medicine himself. He told me that he reached for the bottle, grasped it firmly—as he thought—by the neck, and raised it from the table, but it immediately slipped from his grasp and fell to the floor. The voice had not completely recovered. There was a dilatation of the right side of the heart, with systolic murmurs. There was no albumin in the urine. The feet were still swollen. The knee-jerk of the left leg was the first to return, and that of the right leg a month later. The heart condition was so critical that he was not allowed to rise until the middle of November. During all the time he was in bed, his servant had massaged and moved his legs, so that when he was allowed to rise, he was able, within about a week to walk by himself. His gait, however, was for sometime slightly ataxic.

This patient's residence, where he had lived continuously for six months before he contracted his disease, was in the Yerba Matté virgin forests. From the same district many peones, or native labourers, come suffering from buba, or *Leishmaniasis americana*. The water used at his station was from a stream running towards the Parana valley. As manager of a plantation, the patient had been able to live in comfort, and feed well. His ordinary diet consisted of fresh meat every day, beans, rice, vegetables, fruit, mandioca, maize, bread. The patient was

a very abstemious man, and, besides, alcoholic liquors are not allowed on the plantations. The patient, recalling his earlier attack twenty years before, and the fact that he had recovered completely within a month and a half, did not agree with my diagnosis that his disease was beriberi, and, besides, no others were known to have suffered from such a disease in that district during the years he had been resident there. Two years previously, however, a case was brought to me from a place a few leagues distant from A. P. C.'s residence, suffering from the dropsical form and with a very bad heart. He unfortunately died shortly after he arrived. I have notes also of a case exactly similar to that of A. P. C., the patient coming from the same district in 1911. He took some six months to get well, and only began to shew marked improvement when he went down to Buenos Aires, a distance of some 1,500 miles. He returned from there completely cured.

I could obtain no history of any epidemic of a similar disease in the district from which these cases had come.

The patient, A. P. C., made an excellent recovery, and when he left was enjoying better health than he had done for many years.