Photocopy of Sir David Bruce's paper in the Journal of the Royal Army Medical Corps, 1910, re brucellosis ("Muhinyo") among tribes in Uganda

wellcome collection

Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
https://wellcomecollection.org

VOLUME XV. NOVEMBER, 1910. No. 5.

Journal
of the
Royal Army Medical Corps.

Original Communications.

"MUHINYO," A DISEASE OF NATIVES IN UGANDA.[1]

BY COLONEL SIR DAVID BRUCE, C.B., F.R.S.,
CAPTAINS A. E. HAMERTON, D.S.O., AND H. R. BATEMAN,
Royal Army Medical Corps,
AND
CAPTAIN F. P. MACKIE,
Indian Medical Service.

WHEN the Sleeping Sickness Commission passed through Kampala, the native capital of Uganda, at the end of October, 1908, on their way to their camp at Mpumu, they were informed by Sir Apolo Kagwa, K.C.M.G., the Prime Minister, that a new disease had broken out in the province of Ankole, and that many people were sick.

This is probably the same disease which was described by Dr. A. G. Bagshawe in 1906. He gives the history and symptoms of nine cases which he saw in Ankole. He concluded that the disease was beri-beri, and states that at one village 25 per cent. of the inhabitants were suffering from a more or less severe form of the disease.

In the same year Dr. L. D. Lowsley also described "Muhinyo," but was of opinion that it might possibly be dengue with persistent joint pains.

Nothing more seems to have been written about "Muhinyo" until the beginning of 1909, when Dr. A. C. Rendle reported its

[1] Reprinted from the *Proceedings of the Royal Society*, B. vol. 82.

PROVED by BRUCE to be BRUCELLOSIS

presence in large numbers in the country round Lake Albert Edward. He says that all classes suffer, and that he has no hesitation in saying that "the disease is chiefly allied to kala-azar, the black death of India."

Thanks to the kindness of Sir Apolo Kagwa and Chief Saulo Mayanja Lumama, the Commission had an opportunity of seeing a case of "Muhinyo," which was sent to Mpumu from Ankole in January, 1909. This patient, who was said to have been ill for three months, was extremely weak and thin, but otherwise he showed no symptoms which pointed to any special disease.

As no other cases could be sent such a long journey as to Mpumu, it was decided that a member of the Commission should proceed to the district, in order to examine sick natives whom A. H. Watson, Esq., the District Commissioner, had kindly undertaken to have collected there.

On May 23rd, 1909, Dr. A. D. P. Hodges, the Principal Medical Officer, Uganda Protectorate, accompanied by Colonel Sir David Bruce, Director of the Commission, went to Masaka, on the borders of Ankole, where they found some fifty sufferers from this disease awaiting them.

Distribution of "Muhinyo" in Uganda.

The principal focus of the disease is along the eastern shore of Lake Albert Edward, which corresponds nearly to longitude 30° E., in the latitude of the Equator. The most severe cases have been met with at Katwe (Fort George), a settlement on the eastern shore of Lake Albert Edward. It appears to have spread down the eastern shore of this lake, and to have extended in a south-easterly direction into Ankole. Cases have been recorded as far east as the western shore of Lake Victoria, and as far north as the Katonga River, which runs parallel to, and about ten miles north of, the Equator. The disease is therefore quite limited in its distribution.

There is no evidence to show how it originated.

Epidemiology.

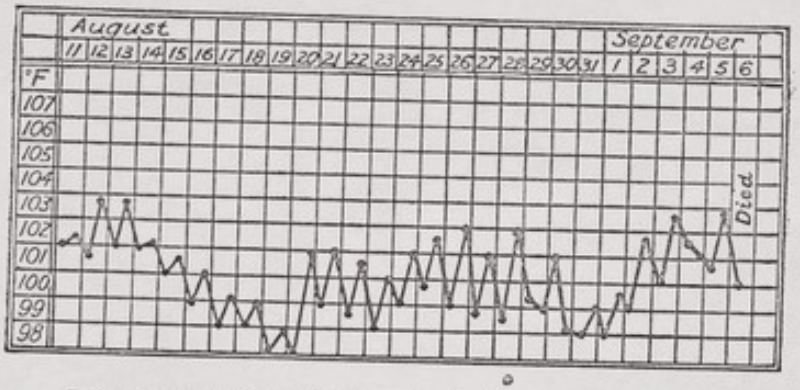
The tribes most affected by the disease are the Bakonjo and the Basongora. The former are morally and socially about the lowest class of people to be met with in Uganda. They are abjectly poor and dirty in their persons and in their habits. They live in rude grass huts, which they share with their domestic animals. The Bakonjo keep goats and, if they can afford them, cattle also. They prefer the milk of the cow, but also drink largely of goat's milk.

The Basongora are a higher type of native, and resemble in appearance and customs the Bahima, the aristocracy of Uganda. They are not so poor as the Bakonjo, whom they use as serfs; they keep cattle and goats, and consume the milk of both animals. The flesh of the goat is largely eaten by both classes in a partially-cooked state. The milk of sheep is occasionally used in default of that of the other animals.

Clinical Symptoms of "Muhinyo."

As the result of the examination of the fifty cases sent into Masaka, it appeared that the principal symptoms of "Muhinyo" are fever, profuse sweating, pains in the joints and along the course of nerves, swelling of the various joints, especially the ankles, and extreme weakness and emaciation. The disease is of long duration; most of the patients had been ill for several months. In 13 cases, taken at random, the average duration was three and a half months. Another had been ill for two years.

The following temperature chart was the only one which could be obtained.



In most cases there was no marked enlargement of the spleen or liver, nor symptoms of paresis or paralysis. The microscopical examination of the blood showed various degrees of anæmia, but no parasites or marked changes in the white blood corpuscles could be detected. Further, the examination of the splenic pulp, obtained by puncture of the spleen, failed to reveal the presence of the parasites of kala-azar. It was therefore evident that "Muhinyo"

was neither kala-azar nor beri-beri, but the long duration of the fever, the joint pains, and the extreme weakness and emaciation suggested a continued fever, such as typhoid or Malta fever.

Examination of the Blood for Agglutinative Phenomena.

The blood of several of these cases was therefore tested with *Bacillus typhosus* and *Micrococcus melitensis* by Widal's method, with the result that no reaction was obtained with the former, but positive results, in fairly high dilutions, were got with the latter.

The following table represents the result of the examination of the blood of "Muhinyo" with a strain of *M. melitensis* from Malta, from which it will be seen that five out of the seven cases examined gave a positive reaction:—

Table I.

Number of experiment	Dilution of serum			Control
	1 in 50	1 in 100	1 in 200	
927	+	+	−	−
928	+	+	−	−
929	−	−	−	−
930	−	−	−	−
931	+	+	+	−
932	+	+	+	−
933	+	+	−	−

Isolation of the Micrococcus of Malta Fever from the Spleens of Cases of "Muhinyo."

The next thing to be undertaken was the isolation of the *M. melitensis* from the tissues of patients suffering from "Muhinyo."

The spleens of two cases (925 and 926) were punctured in the usual way, and the splenic pulp smeared on the surface of tubes of nutrient agar-jelly. Small white colonies were grown from both cases, and these were sub-cultured and used to study the morphology, cultural characters, and animal reactions of the organism of which they were composed.

Morphology.—Under the microscope the organisms were found to be minute micrococci, indistinguishable in size or appearance from the *M. melitensis*.

Cultural Characters.—In the same way it was found that the sub-cultures of the organism showed after some days as minute transparent colonies, resembling tiny drops of dew, which after-

wards became more opaque, and in no way differed from colonies of *M. melitensis* cultivated under the same circumstances.

Animal Reactions.—The sub-cultures were also emulsified in saline solution and injected into a monkey and rabbit. The monkey sickened with fever, and when the agglutinating power of its blood was tested with the strain of *M. melitensis* from Malta it was found to give a complete reaction in a dilution of 1 in 200. Having thus proved that two animals treated with the "Muhinyo" organism gave a serum capable of agglutinating a known *M. melitensis* from Malta, the converse experiment was made.

A rabbit was inoculated with the Malta strain, and its serum tested on the "Muhinyo" organism. This rabbit's serum, immunised against Malta fever, agglutinated the "Muhinyo" organism in a dilution of 1 in 200; and thus the proof that the micrococcus obtained from the spleen of "Muhinyo" cases and that obtained from cases of Malta fever were identical was established.

Examination of Goats from the "Muhinyo" District, to ascertain if they are Reservoirs of the Virus of Malta Fever.

By Widal's Reaction.—In Malta the Royal Society Commission discovered, in 1905, that the drinking of goats' milk was the sole mode of infection in Malta fever. Many of the Maltese goats were examined, and 50 per cent. of them found to be affected in some way by the disease, while 10 per cent. were actually excreting the *M. melitensis* in their milk.

It was therefore a matter of importance, as well as curiosity, to ascertain if the Ankole goats also suffered from Malta fever, and if the causation of this disease was the same in Central Africa as it had been proved to be on the shores of the Mediterranean, in the Soudan, and in South Africa.

When Sir Apolo Kagwa was approached as to the feasibility of obtaining goats from the most affected districts, he informed the Commission that he would see what could be done. About six weeks later a flock of goats, numbering in all twenty-four, was driven up to the laboratory at Mpumu, and it was stated that these had come from a place where "Muhinyo" was common. They were at once examined, with the result that the blood of three out of their number reacted to the strain of *M. melitensis* obtained from cases of "Muhinyo," and also to the Malta strain.

The following tables give the details :—

TABLE II.—MICROCOCCUS MELITENSIS ("MUHINYO" STRAIN).

Number of experiment	Dilutions of serum					Control
	1 in 10	1 in 20	1 in 50	1 in 100	1 in 200	
1512	+	+	+	−	..	−
1507	+	+	+	+	..	−
1776	+	+	+	+	+	−

TABLE III.—MICROCOCCUS MELITENSIS (MALTA STRAIN).

Number of experiment	Dilutions of serum				Control
	1 in 10	1 in 20	1 in 50	1 in 100	
1512	+	+	+	−	−
1507	+	+	+	+	−

Isolation of the Micrococcus of Malta Fever from the Tissues of the Goats.—After having found that some of the Ankole goats reacted to the agglutination test, an attempt was made to isolate the *M. melitensis* from their tissues. This proved successful in two cases. The following experiment gives one of these in detail :—

Experiment 1475. *Goat.*

August 11th, 1909.—This goat, which was one of a herd from Ankole, died this morning. The spleen was removed, and small portions of the pulp spread over the surface of agar tubes.

August 16th.—A growth consisting of several very small, round, white colonies appeared after three days. A stained preparation from one of these showed that they were composed of organisms resembling *M. melitensis*. Sub-cultures made.

September 29th.—The growth from two agar tubes was made into an emulsion with salt solution, and an agglutination test made with serum from a rabbit immunised against *M. melitensis*, Malta strain.

The result was that the organism from the goats agglutinated completely in a dilution of 1 in 100, and the proof was complete that the Ankole goats are liable to contract Malta fever, and to act as a reservoir of the virus.

CONCLUSIONS.

(1) "Muhinyo" is Malta fever.

(2) "Muhinyo" is conveyed from the goat to man by the drinking of goat's milk.