

Note upon the Examination, with Negative Results, of the Central Nervous System in a Case of Cured Human Trypanosomiasis.

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This is the first case in which "a chance has occurred of examining a cured case of human trypanosomiasis *post mortem*," according to the statement of C. A. Wiggins, the Acting Principal Medical Officer of the Uganda Protectorate, who has kindly forwarded me the tissues for microscopic examination.

Summary of the History of the Case.—Narain Singh, a Sikh, belonging to the 4th K.A.R. (aged 30 at death), was found to be suffering from trypanosomiasis in June, 1905, and received treatment with inorganic arsenic. The previous history as far as ascertainable, compiled from extracts of reports and history sheets, is published in the full account, but, in brief, it may be assumed that the drug was given intermittently for 18 months or more, and pushed till toxic symptoms of neuritis, mental dullness, etc., rendered further energetic treatment impossible; trypanosomes were then no longer obtained by puncture of the glands. Unfortunately there is no note of lumbar puncture having been performed until a few months before death, therefore we do not know whether invasion of the sub-arachnoid space ever occurred either before or after the treatment. But it is probable that trypanosomes were never present in the cerebro-spinal fluid, for if they were, the symptoms of Sleeping Sickness would, in all probability, have come on, in spite of treatment by atoxyl. Sir David Bruce, in December, 1908 (that is three and a half years after the trypanosomiasis had been discovered), saw this man, and stated that he appeared to be in excellent health. A year later he was seen by Captains Hamerton and Bateman, who reported no symptoms of Sleeping Sickness. They made a very careful investigation of the blood, both by microscopic examination and by experimental injection into monkeys; the results were negative. In June, 1910, lumbar puncture was performed, and 17 c.c. of fluid withdrawn; the centrifuged fluid showed no lymphocytosis or trypanosomes; and injection of the fluid into a monkey was followed by negative results. The patient was attacked with pneumonia in August, 1910, and died three days after admission to the hospital. At the *post-mortem* examination grey hepatisation of the whole right lung was discovered. Beyond fibrosis and induration of the cervical and inguinal

glands there was nothing noteworthy in the appearance of the organs and tissues. The brain was quite normal in appearance, and there was no excess of fluid.

It may be mentioned that this man contracted syphilis on July 27, 1906, and he was treated for some time with mercury, and a note on February 15, 1908, is as follows:—Condition the same as August 6, 1907, but no trypanosomes found in blood or glands, due to fact of taking mercury for syphilis.

Histological Examination.—Sections were prepared of portions of the cerebrum, cerebellum and medulla oblongata, by all the methods which I have previously adopted for the examination of the tissues of Sleeping Sickness cases. I found no trace of the characteristic meningeal and perivascular infiltration, nor of gliosis. Sections of the spleen, liver, and kidney were also examined with negative results.

I have shown that there is a parallelism between the intensity of the signs and symptoms of Sleeping Sickness and the diffuseness and intensity of the lymphatic perivascular infiltration with lymphocytes and plasma cells which is the main cause of the clinical phenomena.

It may be asserted that this case proves that human trypanosomiasis is curable, but it does not prove that Sleeping Sickness is curable, for I contend that the diagnosis of "Sleeping Sickness" can only be made when there is proof that the trypanosomes have invaded the sub-arachnoid space. The case emphasises the importance of early diagnosis of the infection and the value of early energetic treatment by organic arsenic preparations. How far the administration of mercury assisted to complete the cure is uncertain.

UGANDA PROTECTORATE.

DEATH REPORT.

Entebbe Station, August 17, 1910.

Name.	Nationality.	Age.	Sex.	Date of admission.	Date of death.	Disease for which admitted.	Cause of death.	Place of death.
Narain Singh, No. 4662 I.C. 4th K.A.R.	Sikh	30	Male	3.8.10	6.8.10	Bronchitis	Pneumonia	Indian Contingent, 4th K.A.R. Hos- pital.

Previous history as far as ascertainable, compiled from extracts of reports and history sheets:—

22.6.05. Trypanosomiasis. Received treatment inorganic arsenic.

4.12.06. Gland puncture. Trypanosomes +.

Four injections 2 c.c. atoxyl 20 per cent. December 6, 7, 16, and 17.

18.12.06. Glands trypanosomes +.

28.12.06. Glands trypanosomes -. Atoxyl 20 per cent., 2 c.c.

29.12.06. Repeated atoxyl 20 per cent., 2 c.c.

30.1.07. Glands trypanosomes -.

8.2.07. Glands trypanosomes -.

Condition.—Arsenical neuritis. Drowsy looking. Rheumatic pains.

6.8.07. Condition far from satisfactory. Irregular fever, rapid pulse. Dull and stupid. Cervical glands enlarged. Trypanosomes not found in glands since March, 1907. Energetic treatment with arsenic impossible owing to symptoms of poisoning rapidly appearing.

15.2.08. Condition the same 6.8.07, but no trypanosomes found in blood or glands, due to the fact of taking mercury for syphilis (contracted 27.7.06).

16.12.08. *General Condition.*—Strong, well nourished. No tremors. Reflexis normal.

Gland puncture and blood examination trypanosomes -.

Differential count. Lymphocytes 70 per cent.

Some tendency to drowsiness when unoccupied.

Last treatment, two injections kharsin, May, 1908.

18.12.08. Proceeded to Mpumu to do duty with the Royal Society's Sleeping Sickness Commission. Report by Sir David Bruce—"This man appears to be in excellent health." Returned to Entebbe.

16.12.09.—Report by Captains Hamerton and Bateman, R.A.M.C., Sleeping Sickness Commission, Mpumu—"No symptoms of Sleeping Sickness."

Blood Examination.—Examined peripheral blood. Negative results 14 occasions.

Examined centrifuged peripheral blood. Results negative.

Examined blood from median basilic vein. Results negative.

Examined blood from median basilic vein centrifuged. Results negative.

16.12.09. 4 c.c. blood from median basilic injected into monkey.

29.12.09. 5 c.c. " " " " "

1st monkey examined 15 times. Results negative.

2nd " " 12 " " "

13.6.10. Lumbar puncture 17 c.c. Cerebro-spinal fluid abstracted centrifuged. Trypanosomes -. No excess white cells. 12 c.c. injected into monkey. Monkey examined twice weekly over one month. Results negative.

General habits.—Intemperate. Had gonorrhœa and syphilis.

Post-mortem appearances 14 hours after Death.

Body of lean but in no way emaciated man.

Externally.—Cervical glands—small, hard, and shotty. Inguinal glands—small, hard, and shotty.

Chest.—Parietal and visceral pleura adherent right side, due to recent pleurisy.

Right Lung.—Weight 58 ozs. On section the whole lung was in a state of grey hepatisation.

Left Lung.—Weight 14 ozs. Pleura and lung substance normal.

Heart.—Weight 12 ozs. Right heart distended with blood clot. All chambers and valves normal. The glands at the root of lungs and around bronchi and trachea were enlarged and soft, and some were purulent.

Microscopic.—Examination of this pus showed organisms resembling pneumococci.

Liver.—Weight 89 ozs. Enlarged and congested. On section, soft and friable. Probably some fatty change. No obvious fibrotic changes.

Portion preserved for microscopic examination in England.

Spleen.—Weight 14 ozs. Feels hard to the knife on section. Pale appearance and excess of fibrous tissue on cutting open.

Portion preserved for microscopic examination in England.

Kidneys.—Right, weight 5 ozs. Left, 6 ozs. Both were swollen, the kidney substance bulging from the capsule when cut into.

Both capsules were a little adherent.

Cortices undiminished. The whole kidney substance appeared a little paler than normal.

Portions preserved for microscopic examination in England.

Pancreas and Suprarenals.—Normal.

Stomach.—Slightly dilated. No gastritis. Some *post-mortem* staining.

Intestines.—Normal. Mesenteric and retroperitoneal glands not enlarged.

Brain.—Calvaria normal. Weight of brain, 52 ozs. No thickening of membranes. Brain substance normal. Ventricles normal in size and no excess of fluid.

Portions of cerebral cortex and cerebellum preserved for examination in England.

(Signed) H. B. OWEN,

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Auto-Agglutination of Red Blood Cells in Trypanosomiasis.

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From the Runcorn Research Laboratories of the Liverpool School of Tropical Medicine.)

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Introduction.—It is now a well recognised fact that the erythrocytes in fresh preparations of the blood of Sleeping Sickness cases and animals