

except that she was quieter, and her temperature rose to 100°. On January 30th she was much better, recognized people, and talked a little quite sensibly, but had no recollection of the last few days' illness. Temperature subnormal.

At 2 a.m. on January 31st she became drowsy, recognized no one, and would not respond to any questions. Her eyes were deviated to the right and upwards, axes parallel; she could look in any direction, and there was no oculo-motor paralysis or nystagmus, but when at rest the eyes assumed the position just noted. The discs were normal. We saw her again in consultation the same afternoon, and noticed that the frontalis muscle over the right eyebrow was more contracted than on the left side. Whilst remarking on this, she repeatedly and rapidly put her right hand to her mouth, then suddenly pursed up her lips, and the right angle of the mouth was drawn strongly outwards. Next the right side of the face became contracted by clonic spasms, and the convulsion spread to the right arm and then to the whole of the body, the eyes were turned to the left and upwards, she frothed at the mouth and became a little cyanosed. She soon recovered from the fit, and was found to have no weakness or paralysis anywhere. The right knee-jerk was absent and the left normal; no plantar reflex on either side. We thought that the occurrence of this Jacksonian convulsion supported the opinion originally formed of a gross lesion, probably an abscess, being present just below the termination of the Rolandic fissure. The severe symptoms with slight rise of temperature, which occurred after the extraction of the teeth, might have been caused by a little meningitis over such a lesion, while the fit was an indication of the process spreading upwards. We therefore advised an operation as holding out the only chance of recovery, but this was refused by the patient's friends.

On February 1st at midday she was much worse, respirations 40, and of the Cheyne-Stokes rhythm, pulse rapid and weak, temperature 98.4°.

On February 2nd she was much the same except that the eyes were divergent, both being turned outwards. She gradually sank and died on February 3rd without regaining consciousness or having any more fits.

Necropsy.—At the necropsy, which was limited to the brain, the substance of the organ on section looked quite normal everywhere. The convolutions on both sides seemed a little flattened, but there was no distension of the ventricles. The pia arachnoid at the base of the brain in front of the optic chiasma was injected and studded with small tubercles, especially along the Sylvian fissure on the left side; there was no lymph exuded, no matting, and no excess of fluid.

The only symptom in this case which did not fit in with our diagnosis of cerebral abscess on the left side was the conjugate deviation of the eyes. If there had been such a lesion the eyes during the convulsion should have been turned to the right instead of to the left, while when at rest they should have looked to the left. The symptoms certainly seemed to warrant the diagnosis of a cerebral abscess in a situation that could easily be reached by an operation, but fortunately, as it turned out, the decision of the patient's friends saved us from a procedure which would have been quite useless.

SOME OBSERVATIONS ON THE MORPHOLOGY OF THE TRYPANOSOMA FOUND IN SLEEPING SICKNESS.

BY DR. ALDO CASTELLANI.

IN my preliminary note read at the Royal Society on May 14th, 1903, and in a more complete paper of mine published in the *Journal of Tropical Medicine*,¹ June 1st, 1903, I stated that in sleeping sickness I had found very frequently a trypanosoma which I thought to be the probable cause of the disease. I found the trypanosoma in the cerebro-spinal fluid taken during life by lumbar puncture in 70 per cent. of the cases. The trypanosoma may be found also in the blood, and I actually found it there in a case as far back as December, 1902, as can be seen from the tables attached to my preliminary note. In this note I propose to give briefly a few details on the morphology of the parasite observed in fresh and stained preparations.

Fresh Preparations.

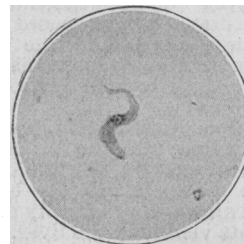
The parasite has the usual general outline of the other trypanosomes. It has a worm-like shape; one end terminates with a flagellum, the other is more or less bluntly conical; there is an undulating membrane and a vacuole. The proto-

plasm does not appear to have quite a uniform structure, but rather an alveolar one, as described by Bradford and Plimmer in *trypanosoma brucei*, although apparently far from being so well marked. At first the parasite moves fairly actively in a screw-like fashion, as described in the other species of trypanosomes. On observing the preparation for some time with the microscope one sees that the movements become more sluggish, until they stop altogether. Frequently the trypanosome stops near a leucocyte, which by degrees engulfs it. On several occasions I have observed trypanosomes with apparently two well-marked flagella; the parasites were probably in a stage of longitudinal division.

Stained Specimens.—Leishman's modification of the Romanowsky's method gives very good results. Staining the trypanosome in this way the macro-nucleus, micro-nucleus, and flagellum appear red, the protoplasm blue, while the undulant membrane remains almost unstained. The nucleus is generally large and of variable shape; it is as a rule situated in the posterior half of the parasite. The micro-nucleus (Plimmer and Bradford) or centrosoma (Laveran and Mesnil) does not show any apparent structure. It stains red, but of a much more vivid colour than the nucleus. It is situated very near the posterior end of the parasite, and generally outside the vacuole. The vacuole is oval and of rather large dimensions; it is situated anterior to the micro-nucleus.

The flagellum takes origin apparently from the micro-nucleus; then, following the external edge of the undulating membrane, reaches the anterior end, where it becomes free. The free portion of the flagellum is apparently longer than in other trypanosomes.

The protoplasm does not stain evenly, nor very deeply; it does not show many chromatic granules. The total length of the parasite is from 18 μ to 26 μ . The width is from 2 μ to 2.5 μ .



Photograph of the trypanosoma found in the cerebro-spinal fluid of a case of sleeping sickness. $\times 1,000$.

Developmental Forms of the Parasite (?).

In the blood taken from the finger, especially during the last stages of the disease, in the blood of the heart, as well as in the cerebro-spinal fluid, I have seen frequently large roundish bodies 14 μ to 16 μ in diameter with one or more vacuoles, which on superficial observation might be taken for amoebae if it had not been that they did not emit pseudopodia. These bodies stained by the Romanowsky-Leishman method showed two or more points where the chromatin collects. I am inclined to consider these bodies as developmental stages of the trypanosome. Something similar has been described by Kempner and Rabinowitch in *trypanosoma lewisi*.

Identification of the Parasite.

The only species of trypanosoma so far known in man is *trypanosoma gambiense* (Dutton). Though others may have seen it before (Nepvue, Forde) there is no doubt that Dutton was the first observer to describe it scientifically. Dutton and Forde were the first to draw attention to its relation with a specific fever which principally attacks Europeans in the tropics. This species of trypanosome has hitherto been found in the blood only. No trypanosome of any sort had ever been found in sleeping sickness.

As regards general shape and size the *trypanosoma gambiense* and the one I have found in sleeping sickness do not differ much, but according to my experience differences may exist in the position of the micro-nucleus, the vacuole, and the flagellum. In the trypanosome of sleeping sickness the micro-nucleus is generally much nearer the extremity, and as a rule outside the vacuole; the vacuole is generally larger. The flagellum takes origin apparently from the micro-nucleus; the free portion of the flagellum is longer.

These morphological differences, according to my experience, are frequent, though far from being constant. Although I have not yet performed inoculation experiments in the lower

animals, I am inclined to think that it may possibly turn out to be a new species. I am supported in this hypothesis by a recent communication by Kruse to the Medical Society of Bonn.² I do not see any reason why man should not be attacked by different species of trypanosoma, each of which might give rise to a different disease. This fact has been clearly demonstrated in the lower animals. The horse, for instance, is liable to be infected by three different species of trypanosoma—trypanosoma brucei, the cause of nagana; trypanosoma evansi, the cause of surra; trypanosoma equiperdum (Doflein), the cause of the disease called "dourine."

Some observers have tried to identify trypanosoma brucei with trypanosoma evansi, but the most recent investigations have clearly proved that they must be considered two different species, although their morphological differences are slight and inconstant.

REFERENCE.

¹ Castellani, *Transactions Royal Society*, May, 1903, and *Journal of Tropical Medicine*, June 1st, 1903. ² Ueber das Trypanosoma Castellanii den Erreger des Schlafkrankheit, *Sitzungsberichten der Niederrhein. Gesellsch. f. Natur. und Heilkunde zu Bonn*, MAY, 1903.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, ETC.

THE DURATION OF LIFE AFTER GASTROSTOMY FOR CANCER OF THE OESOPHAGUS.

As a contribution to this question I may mention the following case:

A gentleman, aged 64, was brought to me in 1900 with all the symptoms of stricture of the lower end of the gullet. Difficulty of swallowing had been noted for two months, and the patient, when I first saw him, could barely swallow any fluid. The bougie was arrested at the termination of the oesophagus. The patient was much emaciated but was still able to walk about. I performed gastrostomy on July 7th, 1900.

There was a cancerous growth involving the termination of the gullet and extending into the stomach. So extensive was the malignant disease in the stomach itself that it reached nearly the whole length of the lesser curvature. The oesophageal opening was practically closed. There were no secondary deposits visible in the liver. The patient lived until June 9th, 1903—a period of three years less one month. Dr. Batchelor, of Staines, who attended the patient throughout with the utmost care and devotion, writes as follows in a letter to me in which he announces the patient's death: "He was practically free from pain all through his long illness, and the gastrostomy wound has never given the slightest trouble."

Wimpole street, W.

FREDERICK TREVES.

TRAUMATIC RUPTURE OF THE ILEUM.

By an accidental discharge of dynamite during blasting operations a native labourer was struck on the abdomen towards the left iliac fossa by a piece of rock. I saw him about half an hour after. There was merely a slight abrasion externally, but the man complained of great abdominal tenderness, and lay with his legs drawn up. As nothing definite could be made out by examination a sedative was administered, and he was placed in bed for observation, small quantities of iced water being allowed to allay his intense thirst.

Vomiting commenced soon after the accident, and was very persistent. Symptoms of acute peritonitis came on rapidly, and the question of a laparotomy was considered, but had to be ruled out of court owing to local circumstances. His temperature rose rapidly to 104° F. His pulse twenty-four hours after the accident was imperceptible at the wrist, and he rapidly sank, and died about six hours later.

Post-mortem examination showed the presence of extensive peritonitis, the omenta and intestines were reddened and covered with patches of flaky lymph. A rupture was found in the lower part of the ileum; the opening was large enough to admit the end of the thumb, and from it the bowel contents were freely escaping. There was also a tear of the mesentery of the ileum, at some distance from the intestinal wound; this was about 3 in. in length, and involved the whole thickness of the mesentery, but only a small amount of haemorrhage had taken place. The bowels were loaded, which doubtless predisposed to rupture when the sudden compression

took place. The tear in the mesentery was evidently due to the forcing against it at this point of a loop of distended bowel. There was no indication of any other injury to the abdominal viscera.

Salina Cruz, Mexico.

JOHN MCPHERSON, M.B., Ch.B.

RECTAL SERUM THERAPY.

I WAS much interested to read in the BRITISH MEDICAL JOURNAL of May 23rd, p. 1195, Sir Dyce Duckworth's case of ulcerative endocarditis treated by rectal injections of anti-streptococcus serum, as for the last two years the rectal use of serums has been in constant use at the London Temperance Hospital. Our results have been excellent in the case of antidiphtherial serum, but antistreptococcus serum by rectal injection has shown the same uncertainty of effect that it does when administered by the subcutaneous method. Its rectal injection is, however, free from the disadvantages and dangers which may attend the subcutaneous method, such as local abscesses or spreading erysipelatous inflammations, and for this reason may be preferred, as there seems no doubt that it is rapidly absorbed. The rectal method was introduced to the London Temperance Hospital by Dr. Rhodes, the Senior Resident Medical Officer, who is personally responsible for its success.

J. PORTER PARKINSON.

Physician to the London Temperance Hospital, etc.

Wimpole Street, W.

REPORTS

ON MEDICAL AND SURGICAL PRACTICE IN THE HOSPITALS AND ASYLUMS OF THE BRITISH EMPIRE.

ROYAL COLONIAL HOSPITAL, FREETOWN, SIERRA LEONE.

CASE OF ABSCESS OF THE LIVER.

(By W. RENNER, M.D. BRUX., M.R.C.S. Eng., Assistant Colonial Surgeon and Medical Officer to the Hospital.)

J. N., aged 35, a male domestic servant, was admitted into the hospital on September 29th, 1902.

History.—He was a native of the Colony, and had always enjoyed good health. About nine months ago he was engaged as a servant to a miner, whom he accompanied to Sekondi, Gold Coast Colony. They travelled up to Kumasi, and underwent a good deal of hardship. They slept many nights in the bush, and had bad drinking water. He had an attack of looseness of the bowels seven months ago in the bush, and was sent down to Sekondi on the seacoast, from whence he embarked for Freetown. He has been in Freetown for about four months. The looseness of the bowels had stopped. For the last two months he had been losing flesh, and his belly he noticed had swollen. He had had pain on the right side of the belly, and had been suffering from fever (low fever, as he called it).

State on Examination.—Patient was very emaciated, with abdomen enlarged, and a want of symmetry in its contour. The circumference at the umbilicus was 48 in. The liver was found enormously enlarged, the lower border being about 2½ in. above the anterior margin of the ilium and occupying a large portion of the abdominal cavity. About 2½ in. from the margin of the right costal cartilage a large prominence was noticed. The skin was tense, shiny, and pitted on pressure. Adhesion between the skin and peritoneum had already taken place. Palpation gave the idea of fluid. Exploring with a hypodermic syringe a chocolate-coloured fluid was withdrawn.

Operation.—On November 9th the patient was placed under chloroform. An incision of 1½ in. was made through the skin, and a puncture was made with a No. 3 trocar and cannula, to which was attached a rubber tubing of an inch calibre. A large quantity of coffee-brown fluid first escaped, and towards the end it was mixed with pus. A drainage tube an inch in calibre was placed in the wound, and attached to the margins of the skin, and run down to a large wide-mouthed bottle by the side of the bed which contained (1 in 20) carbolic lotion.

Progress.—The abscess cavity was thus continuously drained and washed out twice a day with (1 in 10) hot ical lotion. On November 11th the tube was unfortunately removed from the