THESIS ON TRYPANOSOMIASIS.

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for

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THESIS ON TRYPANOSOMIASIS.

During the military operations in East Africa in 1918, I had the opportunity of observing cases of trypanosomiasis. Three Europeans were under my care. Owing to the courtesy of Captains Hume, Manson and Brierley, R.A.M.C., I had facilities for observing two Europeans and 14 Africans. These were the only cases reported during the campaign. All the cases, but one, were probably infected with the same type of trypanosome, and were treated on similar lines. From this, it seems possible to draw some conclusions, both regarding the symptomatology and treatment of this deadly disease.

Definition.

Trypanosomiasis is a protozoal disease essentially of Africa, and is the term applied to the condition produced by invasion of the blood of human beings with parasites known as trypanosomes. At first there is an irregular fever and trypanosomes are present in the blood.

Sleeping sickness is the terminal phase of trypanosoma infection, when the trypanosomes are found in the cerebro-spinal fluid and the chief symptoms are due to the involvement of the nervous system. Great apathy and listlessness with finally a comatose state are features of this stage.

History.

Although its true aetiology was not apprehended until quite recently, sleeping sickness has been known to exist for nearly two centuries. According to Castellani,

the earliest mention of sleeping sockness so far discovered is by John Atkins, in his little book, entitled "The Navy Surgeon" published in 1734, in the appendix to which he describes "the sleeping distemper", common among the negroes on the Guinea Coast, among whom he had travelled in 1731. It was well known to the slave dealers who, on purchasing slaves, always examined the glands at the back of the neck and any slaves whose glands were enlarged were rejected. The first account given of this symptom is by Winterbottom in 1803, who brought out the importance of enlargements of the posterior cervical glands (Winterbottom's sign); the cases he described occured at Sierra Leone.

The occurrence of trypanosomes was first found in the blood of animals. In 1879 Lewis, in Calcutta, described the trypanosoma lewisi in the rat. In the following year, Evans described a similar parasite, T.evansi. in the blood of horses in India affected with "surra". This disease the natives had always ascribed to the bite of certain bloodsucking flies; He also found that it infested camels, elephants, buffaloes and dogs. Fifteen years later, Bruce discovered that "nagana", a fatal disease of cattle in Africa, was due to a trypanosome T.brucei.

In 1890 Nepveu found trypanosomes in the blood of a man in Algeria, but he established no definite relationship between the organisms and the associated morbid conditions, and the discovery did not attract attention.

In 1901 Forde found a parasite in the blood of a European suffering from an irregular non-malarial fever,

in the River Gambia Colony, and in 1902 Dutton recognised the parasite as a trypanosome. Later, Dutton found a similar organism in the blood of a native of the same colony and suggested the name T.gambiense, which the parasite now bears. Subsequently, many cases were described, both in Europeans and natives, and the association of the parasite with a form of irregular fever was established.

In 1902 Castellani discovered trypanosomes in the blood of cases of sleeping sickness and brought about the establishment of the connection between trypanosomiasis and sleeping sickness. Bruce, Nabarro and other investigators confirmed Castellani's findings.

In 1903 Bruce and Nabarro reported that in Uganda the tse-tse fly, Glossina palpalis, was the transmitter of the infection. This conclusion was also reached by Sambon and Brumpt on epidemiological grounds. In 1909 Kleine discovered the tse-tse fly was no mere mechanical transmitter of the trypanosomes, as had been supposed but was a true intermediate host. After feeding G.palpalis on animals infected with T.brucei, he set the same flies to bite fresh animals at varying intervals. Up to sixteen days the flies failed to convey the infection, but from that period onwards to the forty-seventh day, when the experiment concluded, they communicated the trypanosome to eight animals. Bruce and others have confirmed Kleine's results and have ascertained that they apply to T.gambiense and other trypanosomes.

In 1910 in Rhodesia, Stephens and Fantham established the existence of a more virulent trypanosome, T.rhodesiense. They found that it was associated with a

resistant form of the disease, that animals immunized against T. gambiense succumbed to the Rhodesian trypanosome. Later, Kinghorn and Yorke proved that T. rhodesiense was transmitted by Glossina morsitans.

In 1909 Chagas described a form of trypanosomiasis, especially common in children, which is endemic in parts of the state of Minas Geraes in Brazil, and is transmitted to man and the domestic animals by a species of bug, Lamus megistus. The symptoms of this disease are different from the African trypanosomiasis; an acute type usually occurs in children under one year of age, whilst the type of the disease as seen in adults is mainly chronic. (Stitt.)

Geographical Distribution.

The disease is essentially African. According to Castellani, at times, cases were imported to the West Indies from West Africa but the disease soon died out. No fresh cases occurred as there were no tse-tse flies.

It exists on the west coast of Africa, from Senegal to Mossamedes. It is also present in the Niger and Congo basins, and particularly in Uganda, where it was first noticed in 1900. The more virulent form occurs in Rhodesia.

As regards the East African campaign, the chief areas to be considered are, German East Africa and Portuguese East Africa. In 1902 cases were found in German East Africa. From the writings of German doctors it would appear that the infected areas in German East Africa, at present, are - the southern border of Lake Victoria Nyanza, the vicinity of Lake Tanganyika, and the

neighbourhood of the Rovuma river (which forms the boundary between the German and Portuguese colonies) from Sassawara on the west to Liwale on the east.

Dr Marshall wrote in 1908 that there were two foci of sleeping sickness on Lake Victoria and one on Tanganyika. The disease has been discovered on the islands, Bumbide and Iroba, and on the mainland Ihangiro, opposite to them. Cases of the disease have also been found on Ukerewe Island. Glossina palpalis was found widely distributed on the shore of lake Victoria, and on the rivers in the Shirati district, and sleeping sickness was prevalent there. (The disease was brought along trade routes from West Africa, through the territories watered by the Congo and its tributaries).

In 1910 Wolf met with a case of trypanosomiasis, which came from the Rovuma river area, near its junction with the Sassawara river. It was found that the Glossina morsitans was the transmitter of the Rovuma sleeping sickness and that the trypanosome was identical with T. rhodesiense.

Professor Beck, as a result of his investigations, stated that 10% of the Glossina morsitans in the Rovuma area were infected with trypanosomes.

Previous to the war, no investigation had been made as regards infected areas in Portuguese East Africa, although the Germans considered it most probable that such existed.

In the course of military operations in Portuguese territory, a line of communication was opened up, running from Bandari (on the mainland opposite Port Amelia) through Mahiba (14 miles), Anquabe (44 miles), Medo and

Balama to Lucinje. From Bandari to Anquabe, the road runs through fairly thick bush and is crossed by several small streams, but these dry up in the "dry" seasons. Tse-tse flies were encountered in moderate numbers at Mahiba, and for a distance of seven miles beyond, towards Anquabe. Four of the five cases of trypanosomiasis occurring in Europeans were infected in this area; the fifth case contracted the disease in the Rovuma area. (He was the only one out of 2,000 troops to contract the disease). Careful enquiries were made concerning the native cases and the majority were found to have been in the district adjoining Mahiba, but no definite history could be obtained from the patients themselves.

Another line of communication in Portuguese East Africa ran from Lumbo (opposite Mosambique) through Nampula towards Lake Nyassa - beyond Nampula the veterinary surgeons reported the prevalence of trypanosomiasis amongst cattle, but no cases amongst the troops occurred along the Lumbo line.

Considering the number of troops, including native carriers, operating in Portuguese East Africa, the disease is not easily contracted in the infected areas, as there were very few cases comparatively - 5 white men (including 2 officers) and 13 natives.

In Africa trypanosomiasis is on the increase. This is probably due to the fact that as the country is being opened up, an increased number of natives are moving from place to place, and larger numbers of Europeans settle in the continent. This has occurred to a much greater extent since war broke out, and one may expect further infected areas.

Etiology.

Stitt states: "The African trypanosomiases follow infection with two species of trypanosomes; the more virulent type of the disease occurring in South Central Africa being due to trypanosoma rhodesiense, transmitted by Glossina morsitans, and that of less severe type, but of more general distribution, being due to T.gambiense and transmitted by Glossina palpalis."

Macfie has reported a new trypanosome, T.nigeriense, from young persons in Nigeria. It is said to be less virulent than T. gambiense, and to be transmitted by Glossina tachnoides. Bruce considers T.nigeriense as being T.gambiense.

Regarding other forms of trypanosomes in man, Sir P.Manson states: "Seeing that most of the trypanosomes hitherto studied experimentally are capable of living in a variety of vertebrate hosts, it seems probable that other members of this group of parasites, in addition to T.gambiense, T.rhodesiense, and T.cruzi, may find in man at times a suitable host. Apparently T.lewisi, T.evansi, and T.brucei do not generally thrive in man, but that circumstance does not warrant the inference that he is completely immune against these and all other species."

The trypanosomiasis parasites have a fusiform body. They vary in size, both in length and breadth. According to Stitt "the normal type, as found in the blood, varies from 14 to 20 microns, while longer forms, 20 to 24 microns, are growth ones and, in the longest ones (23-33 microns) we have those preparing to divide longitudinally. In width they vary from 1.5 to 2 microns."

The parasite is a motile flagellate organism and

the body (which stains blue), shows two chromatin staining masses, the one in the centre being the nucleus, and the one at the end (posterior end), the micronucleus or blepharoplast. Adjoining or surrounding the blepharoplast is a vacuole. Along the whole body runs a wavy membrane - the undulating membrane - which projects beyond the body, at the end away from the blepharoplast, as a flagellum; this end of the body is known as the anterior end.

Fry and Ranken have described the extrusion of granules - sharply defined refractile bodies - and this precedes the disintegration of the trypanosomes, and is especially observable in the more chronic forms of trypanosomiasis of men and animals. If occurring generally, it apparently heralds a disappearance of trypanosomes from the blood. It has been suggested that such granules might be infective, explaining the infectivity of blood from which trypanosomes were absent.

In my cases no granules were observed.

According to Manson in some cases the trypanosomes tend to recur cyclically at intervals of a week or more. There is no uniformity in the number of parasites present, sometimes they are fairly abundant - one or two in each field of the microscope - at other times and in the same patient it may be difficult or impossible, even after prolonged search, to find a single specimen. In my cases the trypanosomes were in comparatively large numbers and fairly easily found. This rather favours the view that the parasite was T.rhodesiense, as usually in early cases of infection, it is difficult to find T.gambiense.

As suggested by Mott, and proved by Greig and others they are generally more easily found in the lymphatic glands, which are often markedly enlarged.

In one native case, seen at the Carrier Hospital, Daressalam, which had a cirrhotic liver and developed ascites, the trypanosomes were found in the ascitic fluid.

The parasites are not found in the cerebro-spinal fluid during the stage of trypanosomiasis, but are present on the advent of sleeping sickness.

Points in differentiation of T. rhodesiense from T. gambiense:

1. "In human blood T. rhodesiense is morphologically indistinguishable from T. gambiense; but if it is passed through the rat a small but variable proportion of the parasites, especially the stumpy forms, will be seen to have their nuclei located posteriorly to the blepharoplast, that is to say, at the non-flagellar end of the organism." (Manson).

2. "Whilst both parasites have been cultivated on a special medium, T.rhodesiense is much more difficult to cultivate than T. gambiense." (Manson).

3. T. rhodesiense is more virulent for laboratory animals than T. gambiense.

4. Animals immunized against T. gambiense succumb to the Rhodesian trypanosome.

5. The clinical course of T. rhodesiense in man is more severe, and this type is much more resistant to treatment.

6. The glands are not enlarged to any degree in the Rhodesian infection, whilst they are usually markedly enlarged in cases infected with T. gambiense.

7. Two different species of flies transmit the trypanosomes, Glossina morsitans transmitting T. rhodesiense and Glossina palpalis transmitting T. gambiense.

As regards the cases amongst the whites under review, Captain Hughes, I.M.S. conducted several experiments in animals, chiefly monkeys and rats.

He injected blood from the patients unto monkeys. Trypanosomes were detected in the animals in six to seven days. One died on the seventh day and two on the twelth day after inoculation. Twice, in the case of the men, a few forms were seen, approaching the so-called posterior nuclear forms, although the nucleus was never located behind the micro-nucleus. In the case of one officer (No.1), death of the monkey occurred on the seventh day, and posterior nuclear forms were obtained, with the nucleus behind the micro-nucleus.

In experiments on rats, infection by inoculating with a patient's blood, was readily induced; the period of incubation averaged 6 days and death took place usually in 12 days. Sub-inoculations from rat to rat, followed much the same course, but posterior nuclear forms were not obtained in the blood of any of the rats.

Captain Hughes considered the parasite as identical with T. rhodesiense, although the strains varied in virulence in different cases, being very virulent in the case of Officer (No.1), and in Middleton (Case 2 of the men). He based his opinion on the rapid way in which animals could be directly infected from man, its marked virulence in them, and the obtaining of posterior nuclear forms.

The clinical manifestations of the disease were certainly those of T. rhodesiense rather than T. gambiense, considering the non-amenability to treatment with atoxyl,

no marked glandular enlargements, the severity of the symptoms and the death of three of the white men within six months of contracting the disease.

Another important factor, which practically clinches the above opinion, was that G. morsitans was prevalent in the areas from which the cases came, and no G. palpalis was ever found.

The Tse-tse Flies.

Manson describes the Glossinae as "sombre-coloured, narrow bodied flies from about 8 to 12 m.m. long, with a thick proboscis (i.e. proboscis enclosed by the palpi) projecting horizontally in front of the head. The palpi are long, slightly grooved on their inner sides, and closely applied to the proboscis, which they almost entirely conceal, the only uncovered portion being a peculiar large bulb-like expansion at the base. Their wings are large, of a brownish hue, and present a characteristic venation, the fourth longitudinal vein bending abruptly upwards to meet the short mid-cross vein. When the tse-tse is at rest its wings overlap on the back, covering each other like the blades of a pair of scissors; this is a distinctive feature. In the males, beneath the end of the abdomen, the external genitalia form a conspicuous knob-like protuberance, which renders the sexes easily distinguishable."

The genus at present comprises fourteen species and of these G.palpalis and G. morsitans are known to infect man with trypanosomes, although many observers consider that other species of glossinae may be found to convey the disease. Both have a wide distribution. G. palpalis is present from Senegal to Angola on the west,

and throughout the Lualaba-Congo system to the Victoria Nyanza, Tanganyika, and Upper Nile reaching as far north as Moolo in the Soudan. G. morsitans extends south in Bechuanaland, North Eastern Transvaal, and Zululand. This fly is prevalent in Portuguese East Africa.

Captain McGregor, attached R.A.M.C., investigated the glossinae prevalent along the principal lines of communication in Portuguese East Africa and the southern part of German East Africa, and reported as follows:

1. Around Mahiba he found that G. pallidipes and G. morsitans were met with but no G. palpalis; G. pallidipes was the more common variety.

2. Between Lumbo and Nampula he found no tse-tse flies, but of the specimens examined which were sent from the district between Nampula and Lake Nyassa, he found G. morsitans, G. Pallidipes and G. fusca, in order of prevalence.

3. Captain McGregor also reported on the Lindi line in German East Africa, which ran from Lindi to Nigomago on the Rovuma, and includes a branch road to Tunduru. In the immediate vicinity of Lindi he found no tse-tse; on the roads from Lindi to Negomano and Tunduru he found four species, viz.- G. morsitans, G. pallidipes, G. fusca and G. brevipalpis. G. morsitans was the most common. The percentage of glossinae infected with a species of trypanosoma, averaged about 11 per cent.

Habitat of Tse-tse Fly.

The tse-tse fly requires considerable moisture for its existence and is found principally in the trees or bush along the banks of the rivers and shores of the lakes. Removal of the bush would keep down the number of flies, but where there is a supply of water, this is impossible for any length of time, as the bush grows very quickly.

According to Manson, Hodges and his colleagues in

Uganda find that the fly ground proper is always a very narrow strip, not more than 10 to 15 yards, and always along the water's edge; and that the insects very rarely extend their feeding beat beyond 60 yards of this. They may, however, follow with great persistency a man who has just passed through this narrow belt, for several hundred yards, rarely as far as half a mile. The areas where glossinae are found are known as "fly belts" and the natives know the limits of these belts precisely.

They are seldom seen 3000 ft. above sea level.

Reproduction.

The glossinae do not lay eggs, but the eggs hatch and the larvae feed, develop and moult within the body of the parent.

Stitt states: "the female gives birth to a single, yellowish brown, motile larva, which is almost as large as the mother and which, upon reaching the ground, bores its way into a coarse, sandy soil for a depth of about 2 inches and then becomes a pupa. The larval stage in the mother lasts about 2 weeks and the pupal stage about a month." "Moisture and sun-light are not favourable for pupal development, the sun being particularly injurious, so that pupae, buried only an inch deep and away from shade, are killed." "Male and female flies bite and transmit the disease. They bite in the day time, usually from 9 a.m. to 4 p.m., and will bite in the sun-light."

On making enquiries from the men who were in the fly areas, this was the common experience, but occasionally they were bitten at night. An entomologist, Mr Pomeroy, who had spent some time in Nigeria, told me he had

frequently been bitten during the night time, whilst on trek there.

The Role of the Tse-tse fly in trypanosomiasis.

Dealing with the life-history of T. gambiense, Miss Robertson, in Uganda, found as follows: "In the fly the trypanosomes are first established in the posterior parts of the mid-gut. Multiplication occurs and trypanosomes of varying sizes are produced. From the 10th to the 20th day long, slender forms develop and pass forward into the proventriculus. These proventricular types reach the salivary glands by way of the hypopharynx. Here further development takes place, multiplication occurs and shorter forms develop, closely resembling the blood type. The development in the salivary glands takes from 3 to 5 days before the forms are infective. The fly is never infective until the glands are invaded."

"Conjugation has not been observed, nevertheless the fly cycle as a whole has the biological significance of conjugation."

Stitt states: "High temperatures, 75 to 85 F. are favourable to development, while low temperatures, 60 to 70 F. are inimical to development, but do not kill the ingested trypanosomes. This explains the long period which at times elapses before a fly becomes infective. Under favourable conditions a fly becomes infective in 20 to 34 days and remains infective the rest of its life, up to 185 days."

"When tse-tse flies feed on animals infected with trypanosomes, only from 2% to 6% become infective."

Kinghorn and Yorke advanced the view that the

large game of the country is a reservoir of the trypanosomes. This conclusion was supported by the fact that with a view to eradication of the disease certain areas have been depopulated, but upon examining the flies caught in the district a year or more later, infected flies have been obtained - in Uganda, the Government removed the entire population of the Sesse Islands and neighbouring shore of Lake Victoria Nyanza to fly free areas in the interior. Three years afterwards, Bruce ascertained that the local flies could still convey the disease to laboratory animals. This supports the view that the large game act as a reservoir for T. gambiense which is prevalent in Uganda.

Yorke as an experimental sanitary measure has advocated the extermination of the large game.

R.B.Woosnam in an article "The question of the relation of Game animals to Disease in Africa" (Journal of the East Africa and Nat. Hist. Soc., December, 1913), considers that domestic animals (sheep, goats, pigs, dogs, fowls), wild birds, lizards, snakes, frogs and toads may harbour the trypanosomes of sleeping sickness and act as carriers of the disease. In which case it would be a hopeless undertaking to attempt to destroy practically all animal life in such extensive areas.

Koch advocated the slaughter of crocodiles.

Bruce and his co-workers have shown that T. brucei, when injected into rats behaves similarly and cannot be distinguished from T. rhodesiense. From this and other facts these observers suggest that the two trypanosomes are the same, that 37% of the wild game in the fly-area harbour pathogenic trypanosomes, and that the

water buck, hartebeest, reed buck and duikerbuck are a source of danger to man.

Taute, however, who has carried out research work in Portuguese Nyassaland does not agree with these views. He says that T. brucei can be distinguished from the trypanosomes of sleeping sickness only and solely by the fact of its non-pathogenicity to man. Taute supports this view by certain experiments.

G. morsitans fed on animals infected with T. brucei were subsequently allowed to bite two men; the result was negative, though a number of control animals bitten simultaneously died.

Taute injected himself with 2 c.c. of blood from a trypanosome infected dog, the trypanosomes being of the Rhodesian type; there was no bad effect. 14 days later he injected 90 c.c. of his own blood into susceptible animals; these animals did not become infected - showing that the human organism has the power to kill this particular trypanosome.

As Stitt points out, these experiments are not conclusive, as it is well known that men in good condition are not easily infected by the trypanosomes.

Many think that we may have trypanosome carriers and that such persons in the enjoyment of health may act as reservoirs of the virus.

Koch, from observations in Uganda stated that trypanosomes may be communicated by the male during coitus. He noted the infection of 15 women in a fly-free district after the return home of their husbands from fly districts where they had contracted trypanosomiasis. Bernard has noted the same method of infection of prostitutes.

Dourine, a trypanosome disease of horses, caused

by T. equiperdum, is transmitted by the sexual act.

According to Griggio, trypanosoma infection is not as a rule transmitted to the foetus; the abortion rate, however, in the infected is increased from the normal 7% in Congo natives to 31.7% and the infant mortality from 39% to 50%.

Incubation Period.

Castellani states - "probably in most cases it does not exceed two or three weeks, and, according to Martin and Lebeeuf's observations in Europeans, it may be even less than 10 days. On the other hand some infected individuals may not show any sign of disease for months, and, it is said, even 5 or 6 years.

Sanderson (Case 1) was the only one to give a definite history re a particular bite and in him symptoms of trypanosomiasis developed as early as 4 or 5 days afterwards. If this was the infecting bite, the incubation period was 4 or 5 days.

Symptoms.

1. Sir P.Manson suggests that "the bite of an infected glossina is followed, in a proportion of cases, by a degree of local irritation of greater or less severity." This was present in Case 1 (Sanderson).

2. After the invasion period irregular pyrexia or period of trypanosome fever ensues. Sir P.Manson states that "irregularity of degree and duration is a feature of the fever."

In the Europeans the irregularity of the

pyrexia was a marked feature, fever being present for varying periods. In Case 1 (Sanderson), after treatment was suspended, there was a rise and fall of temperature, more or less, every day. The chart of Case 3 (Monk), from the date of the first record, for 33 consecutive days shows a temperature above normal, the temperature varying from 99° to 105°, only on 3 days registering 99° or under. Following this, there were 6 days practically of apyrexia, the temperature never reaching above 99°. Later, there was a period of 12 days, when the temperature reached 100° on two occasions only. In Cases 1 and 2 both of whom stood the treatment badly, there was never a period of apyrexia lasting longer than 2 days. The blood examinations made on the Europeans, revealed the presence of trypanosomes usually with pyrexia and absence during the apyrexial period.

Of the 15 native carriers, three only were practically apyrexial; attached charts of 9 cases show Cases C and E to be apyrexial. In the others the pyrexia was not so pronounced as in the Europeans, and it was more quickly influenced by treatment. Only occasionally after the temperature was once normal, was there a rise due to trypanosomes being in the blood. This was noticed in Cases B, E and F; in B. the rise did not occur until 3 months after the temperature had been normal. Intercurrent disease, however, caused a rise of temperature in many of the cases; the cause was generally malaria, but in one case (Case A.) it was due to relapsing fever.

Stitt states - "although fever may be absent in natives until the onset of the period of sleeping sickness, yet in Europeans there are usually noted febrile

paroxysms, lasting for a few days, and followed by febrile periods varying from a few days to 2 or 3 weeks. The temperature curve is of a markedly remittent type, approaching normal in the morning and going up to 103 F. or higher.in the evening - a wide daily range."

In the Europeans, the temperature, as a rule, tended to be higher in the evenings, but daily remissions were not a feature in my cases. In the natives with pyrexia the daily remission was a marked feature.

3. Sir P.Manson states - "The heart's action is generally rapid and easily excited."

Stitt states: "Very characteristic is a low-tension rapid pulse." In my cases frequency and low tension of the pulse were a marked feature; the heart's action was easily quickened, being noticed after the least excitement,or exertion. In Case 1, the pulse rate was slow at first and the tension low, later it was quick and the tension still lower. In Case 2, the tension was medium at first, gradually becoming less and when the patient left hospital, it was decidedly low. In Case 3, the tension was low on admission to hospital, but there was a decided improvement in this and also the heart became less excitable, as the treatment began to take effect. Unfortunately, it was impossible to obtain accurate records of blood pressure, as no recording instruments were available.

In the native cases, the low tension and frequency of the pulse were noticed, and also great increase of the pulse rate on the slightest exertion. The pulse rate at first was between 100 and 140. As in Case 3, marked improvement was effected in all the cases

by treatment, the tension being increased and the pulse rate reduced to between 80 and 100.

A slight degree of anaemia was present in all the cases, both European and native.

4. A common symptom complained of by the Europeans, was of being easily tired. The worst cases amongst the natives, before treatment was instituted, were barely able to crawl about, the others were only able to walk short distances. With treatment a marked improvement was produced.

5. Symptoms referable to the nervous system:

(a) Head-ache was pronounced in Cases 1 and 2, usually when the patient was feverish. Head-ache was not complained of by the natives and only slightly by Middleton (Case 2.)

(b) Lack of mental concentration was noticed in the three white men.

(c) Insomnia, described in text-books, as being present in the early stage, was only present in Case 1, and in him the sleeplessness was due to pains in the limbs, resulting from injection of atoxyl. In the native cases insomnia was only present in one case.

(d) Deep hyperaesthesia or Kerandel's symptom - if the patient strikes a limb against any hard object, a degree of discomfort amounting to actual pain is experienced, the sensation being slightly delayed. Kerandel, who suffered from trypanosomiasis, noted that the fear of striking against objects, became with him an absolute obsession. None of the natives experienced this, and only in Case 3 of the Europeans was it elicited, although he felt no obsession.

(e) Other nervous manifestations were present in Case 3 - loss of memory for recent events and loss of epicritic sense below the tibial tuberosities. Treatment improved all the above symptoms; four weeks after commencing, Kerendel's symptom was not elicited and the epicritic sense was practically regained. Patient's memory improved, his general appearance became brighter and he was able to concentrate his mind better.

6. In all the natives and in two whites, tremor of the tongue and lips was present to a minor degree at first, but later it was not so marked.

7. Glandular enlargements, particularly of the glands in the posterior triangles.

Sir P.Manson states: "that only one gland may be visibly involved or there may be a recognisable general polyadenitis, including the abdominal glands. The implicated glands may be very prominent or they may not be easily felt."

"No enlargement of the lymphatic glands is said to occur in the victims of infection with T. rhodesiense."

In the native cases no enlarged glands were found. In all the three white men glands were palpable in the posterior triangles of the neck; in Cases 2 and 3 they were palpable in other regions. The glands were usually slightly tender, of medium consistence and varied in size between a coffee bean and an almond, but were never enlarged to the same extent as is seen in cases infected with T. gambiense. As trypanosomes were found easily in the blood, microscopic examination of the gland juice was not done.

8. <u>The Skin</u>.

(a) Erythematous areas may be present. Lieut.Col. Newham, R.A.M.C., (Lecturer at the London School of Tropical Diseases) states: "The rash is characteristic and may appear at any time. This rash appears chiefly on the trunk, particularly on the chest and back. Sometimes it appears on the forehead but is not usually seen on the limbs. It appears as a definite erythema of

the skin in large rings, perhaps 2 to 3 inches in diameter. The centres of these rings are frequently discoloured, somewhat like a bruise, and the rings are generally incomplete."

In Case 3 (Monk), irregular patches of erythema were seen on the chest about a fortnight after the commencement of symptoms. In one of the Officers (No.1) about the sixth week after the onset of symptoms, I saw the typical rash. This appeared in the front and back of chest in the form of rings; the rings were incomplete, pink in colour and measured from 2 to $3\frac{1}{2}$ inches in diameter The individual rings disappeared in three or four days, fresh ones appearing. The rash was only noticed during a period of ten days.

In the natives no rash was seen.

(b) Localized oedema.

This symptom was a marked feature in the Natives, but was not present in the Europeans. The swelling occurred under the eyelids and in some of the cases the cheeks were puffy.

9. The Spleen.

"The spleen may be enlarged." (Stitt). The spleen was palpable in the three white men; in Cases 1 and 3, half an inch, and in Case 2, three inches below the costal cartilage. In all three cases malaria may have produced the enlargement, and in Case 2, malaria undoubtedly was the chief cause.

The spleen was palpable in the natives, but in no case was it larger than is generally felt.

10. Liver.

Sir P.Manson states: "The liver also may be enlarged." Only Case 2 showed any enlargement and this may have been due to malaria.

11. Other manifestations: Keratitis, iridocyclitis and choroiditis are stated as sometimes occurring. Sir P.Manson also mentions - "Neuralgic pains, cramps, formication, paraesthesiae, orchitis and painful local inflammatory swellings, which subside without suppuration." Apart from neuralgic pains in the legs, as a result of the administration of atoxyl, none of the above symptoms were noticed in my cases.

Sleeping Sickness Stage.

This is the stage in which the action of the trypanosomes and toxins is manifested chiefly in the nervous system.

The following is a resume of the symptoms as described in text books:

The tired feeling becomes intensified, the gait is a slow and shuffling one and the patient prefers lying still. He is lethargic and morose and his expression vacant. Later the tongue shows a decided tremor, which may also be present in the lips and hands and more rarely in the legs. The patient gradually sinks into a semi-comatose condition, falling asleep anywhere, even with a morsel of food in his mouth. At this stage he can be aroused and will answer fairly intelligently, but with apathy and retardation. Finally weakness and emaciation increases. Convulsions, local in the limbs, or more general, may occur. Bedsores tend to form. The

coma deepens and the patient dies. Frequently pneumonia or dysentery bring about the end.

The majority of observers consider that the sleeping sickness stage rarely lasts longer than a year without treatment, and with treatment not longer than two years.

Symptoms of sleeping sickness did not develop in any of the cases under observation. One case amongst the natives, simulated the symptoms on admission. This patient was lethargic and resented being disturbed, his cerebration was very slow, the face was puffy and anaemia was present to a greater degree than in the other cases. No trypanosomes were detected in the cerebro-spinal fluid, but on examination of the faeces, ankylostomes were found in great numbers. After treatment with thymol the above symptoms cleared up.

Diagnosis.

Any patient who has resided in tropical Africa recently, and especially if he has been in a tse-tse fly area, must be considered as a possible case of trypanosomiasis.

Apart from irregular pyrexia, all other signs and symptoms may be absent and a definite diagnosis can only be obtained by finding the specific parasite in the blood or glands. Important signs when present are the enlarged glands in the posterior triangles of the neck, and the characteristic rash. The following diseases might be confused with trypanosomiasis: malaria, kala-azar, pellagra and syphilis; of these, no cases of kala-azar or pellagra have been met with in East Africa. The chief disease to exclude is malaria.

In the three white men, malaria was first thought of as the cause of the pyrexia. Case 1 was admitted to the Base Hospital as a malarial transfer; Case 2 was subject to attacks and benign tertian parasites were found in his blood after the diagnosis of trypanosomiasis had been established; in Case 3, benign tertian parasites were found in the blood before the trypanosomes.

No case showed the tertian periodicity in the temperature chart. On defervescence sweating is seen in both diseases, but it is greater in the benign tertian variety of malaria. As regards symptoms, with a high temperature, in nearly all malarial cases, the patient complains more of pain in the head, body and limbs; in trypanosomiasis the patient is generally sleepy and does not wish to be disturbed, or occasionally he is irritable and has a head-ache, which may be severe. If pyrexia is not influenced by the administration of quinine, malaria can be excluded.

To diagnose trypanosomiasis from kala-azar, Manson mentions the presence of enlarged glands, local oedema, and erythema multiforme in trypanosomiasis, and their absence in kala-azar; also, bacteriological examination for trypanosomes or Leishman-Donovan bodies - if the blood or gland juice prove negative, puncture of the liver, if enlarged, or spleen, should be done.

In pellagra, there is usually a period of exacerbation of the symptoms in spring; the rash affects symmetrical and sharply delimited patches of skin on exposed parts of the body, and is not ringed or fugitive as that of trypanosomiasis.

As regards syphilis, a positive Wasserman is not of much value, as it is often obtained in trypanosomiasis.

The diagnosis finally rests on finding trypanosomes in the blood or lymph from an enlarged lymphatic gland. In all the cases under review, blood examinations revealed their presence. In the natives, the parasites were found in the ordinary routine examination of the blood, which was done in every case when admitted to hospital. In the case of the Europeans the parasites, as a rule, were easily found, one or two trypanosomes being seen in nearly every field. The best time for taking a specimen of blood, was when the patient had a rise of temperature, but not immediately after the administration of tartar emetic. The following summary indicates the result of 41 blood tests:

(a) In 24 examinations of the blood with a temperature above 99, trypanosomes were present 19 times.

(b) In 17 examinations with a temperature below 99 trypanosomes were only present twice.

In any suspected case, the blood should be examined frequently as the trypanosomes seem to make their appearance in the blood in cycles.

Owing to the difficulty experienced in finding parasites in the peripheral blood, some observers prefer to take 10 to 20 c.c. of blood in about 25 c.c. of citrated salt solution, centrifuging two or three times and examining the sediment of the third centrifugalization. (Nabarro's method). Others prefer, particularly in the earlier stages of the disease, the gland puncture method, using a sterile but dry hypodermic needle. (Grieg-Grey's method).

In the sleeping sickness stage trypanosomes can usually be found in the cerebro-spinal fluid.

Failing discovery of the parasite by the above methods, it is necessary to inoculate susceptible animals, particularly the guinea pig, rat or monkey, with 10 or 20 c.c. of blood or with gland juice from the suspected case, and later examine the blood of these animals for trypanosomes. Apart from diagnosis, such inoculations are of value for testing the virulence of the particular organism and as a test of recovery.

Stitt describes other tests:

1. Trypanolysis - unheated suspected serum and trypanosomes are incubated together for one hour - normal serum may occasionally cause disintegration and treated cases give it in only about 45% of cases. Unfavourable untreated cases give it in about 80% of cases.

2. The attachment test is made by making a mixture of inactivated serum, leucocytes and trypanosomes and allowing them to be in contact for 20 minutes. A positive test shows attachment of the trypanosomes to the leucocytes.

Manson mentions a macroscopic test: "A wet blood preparation exhibits, even to the naked eye, a remarkable clumping of the red corpuscles. Held up to the light, such a preparation has a peculiar granular appearance, produced, as can be seen on microscopical examination, by agglomeration of the corpuscles into heaps and clusters, the usual rouleax arrangement being absent. Such a disposition of corpuscles is significant of, though not peculiar to trypanosoma infection."

Castellani states that it is found in cases of filariasis, malaria, syphilis and yaws.

This appearance was noticed in the slides taken from the cases.

Morbid Anatomy.

Manson states: "No gross lesions of the nerve centres, or of any other organ, have been described as being present."

Of the native cases seen postmortem, apart from the local lesion of the disease causing death, macroscopic appearance of the organs was normal, except in one case, which showed signs of irritant poisoning. This patient had been under treatment for 5 months, and apparently he was doing very well, putting on weight and having been free from any rise of temperature for several days. He was given 3 gr. atoxyl and, to begin with, 1 gr. tartar emetic, both twice weekly. As the symptoms were not being controlled, the antimony was increased gradually and for the last 8 injections he had been receiving $3\frac{1}{2}$ gr. After the last injection, his temperature began to rise, breathing became rapid, pulse very frequent and weak, and he passed into a comatose condition, dying within 30 hours of the injection. The following is the postmortem report on the case:-

The body is well nourished. Subcutaneous fat is greatly increased.

Brain: Normal.

Heart: Externally the heart is covered with a considerable amount of fat; the cavities are dilated; there is no valvular lesion; the muscle walls are very pale and flabby.

Lungs: Patches of early broncho-pneumonia are present in both lungs.

Liver: Enlarged and externally fatty, parenchyma being pale yellow in colour.

Kidneys: Both are fatty. The parenchyma is very pale and it is difficult to differentiate the cortex from the medulla.

Intestines: Omentum and appendices epiploices are very fatty.

Spleen: Slightly enlarged, soft and dark red

Opinion as to the cause of death.

(a) Primary cause: Fatty infiltration and degeneration of the internal organs. The cause of the fatty change is probably due to the cumulative effect of the antimony, but it is possible the atoxyl may have assisted or it may have been the chief cause.

(b) Secondary and immediate cause: Broncho-pneumonia with cardiac failure.

Prognosis.

The prognosis depends on the virulence of the infecting organism, the stage of the disease, and the patient's ability to tolerate the treatment. If the case cannot be removed from the endemic area, the prognosis is bad.

Virulence of the infection varies in different parts of Africa. In the case of T. gambiense, the least virulent is the type found in the Congo; the Nigerian type is rather more virulent, but there is usually good hope of recovery; the Uganda type represents the third degree of virulence. The outlook in all the above types is much more favourable than in cases of infection with T. rhodesiense, which is practically always fatal. Lieut.Col. Newham, R.A.M.C., records one case of

rhodesiense infection, which is apparently cured. This patient was treated in London for two years, when all tests for trypanosomes proved negative and the patient was able to do his work again.

The cases under review were infected with T. T. rhodesiense and the outlook was very bad. Of the five white men (including two officers) one only (Case 3 - Monk) age 20, was able to tolerate the treatment. In him, the trypanosomes were under control and at the time of writing his chances of recovery were good. The other two men, ages 40 and 52 respectively, were unable to stand the treatment and died from asthenia with oedema within 6 months of the onset of the disease. Neither of the two officers were able to take more than grs. $1\frac{1}{2}$ of antimony, and this often caused a very severe reaction. One officer (No.1) age about 40, died in about 6 months time from asthenia with oedema and towards the end he developed epileptiform convulsions; in the other, age 35, who had only been under treatment for a short time, the trypanosomes were not being controlled and also, owing to his anaemic state the veins were collapsed, necessitating dissecting out the vein at each injection, as in Case 2 of the men.

Judging from these cases, it appears that men of middle age, had very little chance of recovery, owing to their inability to take the treatment.

The natives were all able to take the antimony well, without any apparent bad effect. In one case, however, postmortem examination revealed an extensive fatty infiltration throughout the body, with fatty degeneration of the internal organs, and this could only be ascribed to the treatment. (Vide Morbid Anatomy).

Of the other 12 cases, intercurrent disease caused 7 deaths, the causes being:

1. Chronic Diarrhoea.
2. Relapsing Fever.
3. General Debility.
4. Pleurisy.
5. Pneumonia.
6. Pneumonia.
7. Pneumonia.

In these cases, there was no other sign of disease in the body. Pneumonia is a likely and dangerous complication in trypanosomiasis; the 3 natives who died from it, were all doing well, when an epidemic of influenza, complicated frequently with pneumonia, broke out in Daressalam. Two of the cases died on the second day after contracting pneumonia. The remaining natives appeared to be doing well, the trypanosomes being kept under control.

Treatment.

At present the chief drugs employed are arsenic and antimony. Ehlrich and Shiga tried colouring compounds belonging to the benze-purpurin group, of which trypan-red is the best known.

Arsenic.

The early observers gave arsenic in the form of liq. arsenicalis by the mouth. This has been superseded by intramuscular injections of a variety of preparations, including atoxyl, soamin, arseno-phenyl glycin, arsacetin, etc., etc. Atoxyl was recommended by Thomas in 1905 and it has been used largely since. Castellani states atoxyl is sodium-p-amino-phenyl arseniate and contains about 23% of arsenic. This preparation was administered in my cases. The atoxyl was dissolved in 10% normal saline; the solution

was made fresh and if at all muddy in appearance, was not used. It was injected into the gluteal muscles, at a point 3 inches immediately behind the anterior superior spine and the dose given was 3 grs. twice a week. With regard to administration of atoxyl, Sir P.Manson states: "Unfortunately it has one serious drawback - in large doses it is apt to give rise to optic neuritis, and consequent atrophy and blindness. The drug, therefore, must at once be stopped on the slightest threatening - dimness of vision or congestion of the disc - of such a calamity. Gastro-intestinal irritation and peripheral neuritis are also indications that it has to be suspended, at least temporarily, and the subsequent dose reduced."

In Cases 1 and 2 (of the men), the atoxyl had to be reduced to 1½ grs., as both had symptoms of peripheral neuritis. No case of optic neuritis occurred. Case 1 complained of dimness of vision, but this was due to an error in refraction, the retinae being normal.

No reduction of the dose had to be made in any of the natives.

As regards the value of atoxyl, it did not appear to affect the trypanosomes in any of the cases under observation. In Case 1, atoxyl was given alone at first, but with no appreciable effect. Case A. of the native carriers was tried on it alone, for a few days; the trypanosomes were not controlled and the irregular pyrexia continued until tartar emetic was given.

On the other hand, when atoxyl was not given and tartar emetic was solely used, as in cases C. and D. the trypanosomes were controlled just as well, as in those cases where the combined treatment was given.

Apart from the carriers, I saw a case of trypanosomiasis in an askari (native soldier) at the 3rd African Hospital, Daressalam, where atoxyl completely controlled the trypanosomes. The patient was admitted to hospital for a minor ailment, feeling otherwise all right. He presented no symptoms of the disease, apart from the finding of trypanosomes in his blood; these were proved by inoculation tests to be of a much lower virulence than the trypanosomes met with in the case of the Europeans. Captain Hughes, I.M.S., who did the tests, expressed the opinion tht the native, who came from West Africa, had probably been infected there. No tartar emetic was given and after the first injection of atoxyl, trypanosomes were not found subsequently in the blood.

It appears that atoxyl does not affect the more virulent strains of trypanosomes, but is efficacious with the milder strains.

In 1907 Ehlrich and his pupils, Franke and Roehl, discovered that trypanosomes may, after a time, become atoxyl - resistant. Sir P.Manson states: "Unless contra-indicated, atoxyl and antimony treatment should be combined or alternated. One or both should be instituted immediately the diagnosis of trypanosomiasis is established." "As pointed out by Ehlrich, certain strains of trypanosomes are arsenic fast," that is they resist the action of the drug - a property which becomes hereditary and is continued

in sub-inoculations into the lower animals. This undoubtedly accounts for the failure of arsenical treatment in a large proportion of cases. Presumably there are strains having a similar resisting power to antimony. As the atoxyl-fast trypanosomes may respond to antimony, and vice versa, both drugs should be employed in every case."

Of the other arsenical preparations Stitt states: "Intravenous injection of arsenophenylglycin, in doses of about 1 gramm (15 grs.) intravenously has been highly recommended. Recent reports from German East Africa state that of 35 treated with this drug, 6 died of the effects of the drug. Salvarsan and neosalvarsan have been used but apparently without particular success."

"Very favourable reports have recently been made from the use of galyl and ludyl, arsenical compounds."

Antimony.

Plimmer and Thomas introduced tartar emetic.

Regarding the giving of antimony Sir P.Manson states: "In two cases of trypanosomiasis in man in which I used this drug intramuscularly the consequent local pain and irritation (culminating in tissue necrosis) were so excessive that in this form the treatment had to be abandoned. One of the patients, however, continued the drug by the mouth to the extent of 1½ to 2 gr. daily, very highly diluted. a little being given in all his food and drink, and along with atoxyl injections, for over two years. He appears to be quite well."

"It can be given, freely diluted in normal saline, per rectum; but the efficacy of this method has not been proved. Though troublesome and not free from

risk, the intravenous method is the best and the one now generally adopted. The dose is ½ gr., gradually increased to 1½ gr., in 6 oz. or thereabouts of sterile normal saline."

"As with atoxyl, there are differences in the methods of employing antimony injections. Some give them daily in courses of 15 days at intervals of 15 days; others, once a week; others again, according to the indications supplied by temperature and the microscopical examination of the blood."

Stitt states: "Probably the best treatment is one in which three doses of atoxyl are followed by from 10 to 15 daily injections of 0.1 gram. (1½ gr.) of tartar emetic. The course is repeated after an interval of 3 weeks. It is advisable to give a hypodermic of caffein a few minutes before the tarter emetic to lessen depression."

In the cases under observation, tartar emetic was never tried by the mouth or intramuscularly. In Case 2, as no prominent vein could be obtained, the drug was administered for 2 weeks per rectum. It is doubtful if any of the solution was absorbed, as the trypanosomes were certainly not controlled and there was no constitutional reaction afterwards, as one had with the same dose given intravenously.

In the Europeans, the tartar emetic, dissolved in normal saline, was given intravenously, using a funnel, tube and needle, in the same way as salvarsan is administered; in all, about 8 oz. of saline were given at each injection. On two occasions, following the injection, pain and stiffness at the site of the injection, was

complained of. This was probably due to a slight leakage of the drug into the cellular tissues.

In the natives, a 10 c.c. syringe was used and the solution of tartar emetic was injected direct into the vein. This method was quite efficacious and no local trouble followed any injection.

The important points to bear in mind, in administering the drug, are:-

1. That there should be no leakage into the surrounding tissues.
2. That the solution should be well diluted.
3. That the solution should enter the vein at blood heat.
4. That the drug should be administered slowly.

The general effects produced by injection of tartar emetic.

The effects on the temperature (see Charts) in the Europeans, were noticed in relation to the presence or absence of trypanosomes in the blood - blood slides were taken just previous to the injection - with no trypanosomes in the blood, there was generally little or no reaction; with trypanosomes present, there was always a rise of temperature, which was greater when the parasites were plentiful, than when scanty. The rise was often preceded by a rigor. During the first injections or after any increase in the dose of the drug, the rise of temperature was marked, shooting up to 104° or 105°; later, as seen in Case 3, the rises were not so pronounced and definite rigors were absent. In the majority of the native cases, the injections at first caused a sharp rise of temperature, which was down on the following day. Preceding the rise, the patient experienced usually a

slight chilly sensation, but no rigor. This occurred in different cases, for varying periods, from a few days to 8 weeks following the first injection; afterwards, there was rarely any effect on the temperature.

Other effects in the white men.

In Case 1, at first, constriction of the chest with a short cough occurred immediately after the injection, followed in 1 to 1½ hours by a rigor; later, for a period, there was only a slight reaction, until the patient had a very severe one, with gastro-intestinal irritation and profound collapse. No further injections were given.

In Case 2, the first injection caused severe gastro-intestinal irritation with collapse. After subsequent injections, a rigor generally occurred with pain in the bottom of the back. Later, the dose was increased to 1½ gr. but the reaction was too great and intravenous injections were discontinued.

In Case 3, injections of 1 gr. caused only slight constitutional symptoms, usually a slight rigor, occurring about 1 hour afterwards, with a rise of temperature, which was usually down by the next day. With doses of 2 and 2½ gr. immediately following the injection patient had a slight spasmodic cough, lasting for 2 or 3 minutes, and later, usually a severe rigor with a sharp rise of temperature, which dropped to normal by the next day.

The native cases were very little effected apart from the rise of temperature, which was frequently preceded by a chilly feeling. With doses of 2, 2½ and 3 gr.

a short cough occurred as in case 3.

With reference to the cause of these effects, the most probable explantion, is the trypanolytic action of the drug, with liberation of endotoxin.

Dose of tartar emetic used and the patient's progress:-

In all cases, 1 gr. twice a week, was given at the commencement. In Cases 1 and 2, the reaction was so severe, that no increase in the dose could be made, and the trypanosomes soon became tolerant to it. Case 1 was a bad patient to treat, finally refusing to have any further injections. The tartar emetic ameliorated his symptoms at first, and trypanosomes were not found in the blood so frequently as after the injections had been stopped, when the parasites were generally present and in greater numbers, and the patient became progressively weaker and died.

Case 2 was unfortunate in having no prominent veins and the dissection of individual veins with slow healing of the skin, added to the difficulties of his treatment. The small dose, whilst affecting the trypanosomes, did not control them and there was no improvement in the patient's general condition. Before transferring him to a hospital ship, treatment with a solution of antimonium oxide, given intramuscular, was substituted for the tartar emetic, and this was persevered with, but the patient became weaker and died 3 months later in South Africa.

In Case 3 the reaction was never severe and after 1 gr. twice a week, for 30 days, the dose was increased to 2 gr; this was continued for 17 days, when $2\frac{1}{2}$ gr. was given. An increase in dose was made, when it appeared

the trypanosomes were not being controlled; this being judged both by their continued presence in the blood and by the temperature chart. The outlook in this case was decidedly good, as both the patient's general condition improved and the clinical signs of the disease abated.

(Since the paper was written, Case 3 has died from pneumonia following influenza, five months after contracting trypanosomiasis. Up to this time he was doing apparently very well, taking the treatment well and the trypanosomes were under control)

The contrast between the natives and Europeans was marked as regards the amount of tartar emetic which could be tolerated; in the natives, the dose was quickly increased by ½ gr. a time, until 3 and 3½ gr. were given, twice weekly. The natives responded quickly to the treatment, as evidenced by the general improvement in their condition and by the early disappearance of trypanosomes from the blood, slides being examined every day, but it is questionable, judging from the case reported under morbid anatomy, whether they will be able to stand taking such high doses as 3½ gr. over a prolonged period, without serious effects on the internal organs.

Length of Treatment necessary.

The absence of trypanosomes in the patient's blood, may give one a false sense of security. This was exemplified in some of the native cases, trypanosomes reappearing in the blood after being absent for some time:

In case B for 4 months
" " E " 3 "
and " " F " 1 "

According to Castellani, treatment should be continued for at least 2 years and then inoculation tests must be negative before stopping treatment. Lieut.Col. Newham recommends inoculating a monkey, 3 or 4 times, with blood from the patient; if the monkey shows no signs of the presence of the trypanosomiasis parasite, the patient may be considered free. Apart from bacteriological findings, a good test is the patient's capacity for physical endurance.

Prophylaxis.

Segregation of the infected cases and diminishing the number of tse-tse flies in any area are the chief measures.

Where you have a restricted area, sanitary measures can exterminate the disease, as was accomplished in the island of Principe, in Portuguese West Africa. Here, according to an article published in a White Paper (published Ap.22, 1914) on the question of native labour, the workers carried cloths covered with glue or other sticky substance on their backs when working in fly areas, and a great number of flies were caught in this way. Other measures in addition were taken - jungle clearing, drainage, blood examination, segregation of infected cases and killing any possible animal reservoir.

To exterminate the disease by sanitary measures alone, in such widely infected areas as met with in Africa, is impossible at present, but it would be a great advance if by vaccine or serum therapy immunity could be produced in any exposed people.

Prophylaxis as carried out in East African Campaign.

The ideal plan would have been to keep all troops out of infected areas. This was impossible, but instructions were issued that any troops passing through the fly belt zones, should proceed as quickly as possible, and if it was necessary to pitch a camp, the bush had to be cleared for a number of yards around. No troops were allowed to wear "shorts" (trousers leaving the knees bare), and a protection for the face and neck was given to each man, made from green netting with a fine mesh, similar to mosquito netting. Also, if possible, gloves had to be worn or otherwise bamber oil was issued for smearing any exposed parts. All cases of sickness, coming from the area, had to have repeated microscopic examinations of the blood done, to exclude trypanosomiasis, and were kept under observation for one month.

Conclusions.

1. Trypanosomiasis is not easily communicated to man. Large numbers of troops and carriers were in the infected districts for considerable periods. In one instance, a body of 2,000 troops marched through a fly stricken area and only one case occurred. The blood of the 1,999 others was examined with negative results.

2. The Europeans were debilitated and their resisting power was probably lowered.

3. It seems clear that the incubation period may be as short as 5 days. (Vide Case I).

4. The only symptom constantly present, in all the cases under my observation was irregular pyrexia, and the diagnosis depended entirely on the finding of the parasite.

5. Treatment was on the whole unsatisfactory. Atoxyl had no apparent effect on the trypanosomes. Antimony seems to kill the parasites, but in the severer infections with T. rhodesiense, the trypanosomes seem to become resistant.

In view of the fact, that inhabitants of an area infected with trypanosomiasis, seem to acquire a natural immunity to this disease, and that the small African humped oxen are known to be immune to Nagana, it seems possible that in vaccine or serum therapy lies our chief hope for both prevention and cure.

Case 1.

DRIVER SANDERSON, G.W.

S.A.S.C. - M.T.

DRIVER SANDERSON G.W.

SOUTH AFRICAN SERVICE CORPS, M.T.

TRYPANOSOMIASIS

918.
ch 14

The patient is 40 years of age and a Driver in the Motor Transport Service.

He served in the Boer War, having Enteric Fever and later settled in South Africa, where he enjoyed good health.

Patient commenced service in East Africa in July, 1916. From September 1916 to July 1917 he was on duty in the Rufigi area, where he was often bitten by the Tsetse fly but the bites never troubled him.

Previous to the present illness he has had several attacks of Malaria, being seven times in hospital; also he has had two attacks of Dysentery and after the last attack at the end of December 1917 he was sent South for recuperation.

On his return to East Africa at the beginning of February 1918, he was sent to Port Amelia and from February 7th. to the 20th. was on convoy duty between Maheba and Ankuabe, about 35 miles inland. During this time he was frequently bitten by the Tsetse fly, causing a sharp sting, but the effects passed off in a few minutes. During the middle of the day on Feb. 21st. or 22nd., whilst drawing water at the river near Maheba, patient was bitten behind the left shoulder; this was more painful than any previous bite and later, irritable, so in the evening he had the part painted with Iodine. Next day he felt no irritation or pain.

On February 26th. patient felt seedy, suffering from severe pain all over the head; down back of neck and in the loin; he was feverish: through the night he perspired and felt much better on the following morning, but he had no desire for food.

Patient,himself, thought it was an attack of Malaria, but Col. Newham, R.A.M.C. dated the commencement of Trypanosomiasis from this time, and if so, and the severe bite was the infecting bite, the incubation period was 4 or 5 days.

On February 27th. he was admitted to the Camp Hospital at Maheba. Just before mid-night, he woke up with dreadful pains through the

head, chiefly at the back and radiating down the back of the neck to the 7th. Cervical Spine; also he had severe pains in the body, which were most severe in the loin; he experienced no rigor but felt feverish.

On February 28th. at 6-0 a.m., Temperature rose to 101°; he felt seedy all day and did not perspire; he had a good night and felt better the following morning, March 1st, when he was transferred to the hospital at Port Amelia. For the next few days patient felt quite well, except when in the sun's rays when he had headaches, slight fainting attacks, and was easily tired. On March 8th. he was transferred as a Malarial case per hospital ship to Dar-es-Salaam, being admitted to No.2.South African General Hospital on March 10th. 1918. On examination nothing abnormal was detected and patient said he felt alright, apart from feeling weak and being easily tired.

Temperature normal. Pulse 90. Blood slide was negative to Malarial parasites.

Treatment. Quinine Sulphate grs.10. ter in die and ordinary diet. Patient was allowed up between 4 and 6pm.

Until March 14th. he was comfortable, when he complained of feeling tired, head-ache and pains all over body. Temperature at 7pm. was 101.

15. Patient was depressed and drowsy. Temperature 101.2 in morning and at 10 pm. 99.

16. Temperature remained high, the evening temp. reached 105. Through the night he perspired freely.

17. Major Semple, R.A.M.C., O.C., Bacteriological Laboratory, reported that Trypanosomes had been found in the blood slide specimen, which had been taken on March 16th.

Other clinical signs were then noticed:-

General condition: Patient is emaciated, physique poor. Slight enlargement, about the size of an almond, and tenderness of one gland in the posterior triangle on the right side, just behind the Sterno-Mastoid; no other glands were enlarged. There was no rash and no localised oedema; no ocular changes (Retinae normal); no deep hyperaesthesia; Knee jerks were normal; there was no Babinski

and no Ankle clonus; epicritic sense and sense to heat and cold were normal; patient appreciated two points of needles at a distance of 1 inch in the transverse direction and from 1½ to 2 inches in the long axis of the limb.

HEART: No enlargement; no adventitious sounds.

PULSE: 80 per minute, was of low tension.

LUNGS: Normal.

SPLEEN: Palpable ½": no tenderness.

LIVER: Not palpable.

Since admission patient's mental attitude has been variable, sometimes being bright and cheerful, and at other times, usually when his temperature was above normal, he was irritable or apathetic and listless. His appetite was good except when he had a temperature. Bowels constipated.

Absolute rest in bed was ordered and as much nutriment to be taken as possible; the Quinine was stopped. Liquid Cascara was given for the constipation and this had to be supplemented sometimes with Calomel and Salts.

ch 18. Atoxyl grs.3. dissolved in Normal Saline, was injected into the Gluteal muscle at a point 3ins. directly behind the anterior superior spine. No after effects noticed.

Injection was repeated on the 20th., 22nd. and 25th.

22. Bacteriological Report:- Trypanosomes not found.

26. do. do. Trypanosomes found in blood.

27. Tartar Emetic, grs.1. dissolved in 2 ozs. Normal Saline was injected intravenously at the elbow: A solution of Normal Saline alone was first run through funnel, tube and needle into vein, to make sure there was no escape of any fluid into the cellular tissue; the solutions were kept at blood heat, the bottles being immersed in warm water. At the end of the injection, which lasted about 4 minutes, patient experienced a sharp and constricting pain over the lower part and front of chest; this lasted about 1 minute and was accompanied with a short cough. Pulse in the evening was 108. Temperature 100.

28. Patient complained of acute pain over right side of chest.

29. Comfortable.

h 30. In morning pulse and temperature were normal. At 2pm. Tartar Emetic, grs.1. was given; immediately afterwards patiant complained of constricting pain at the lower part and front of chest and he had a short irritable cough. At 3-30pm. he had a rigor, temperature rising to 104 by 6pm.

31. Patient comfortable.

11 1. do. do. Atoxyl grs.2½ injected.

2. do. do.

3. Bact. Report:- Trypanosomes were present in blood. He complained of pains in limbs, coming and going. He was given a mixture containing Sod. Salicyl grs.10. and Potass. Iodide grs.5. and as he had been sleeping badly he was given at bed-time a mixture containing Potass. Bromide and Chloral Hydrate aa grs.10.

4. Temperature at 2pm. was 98. At 2-15pm. Tartar Emetic, grs.1. was injected; constricting pain in chest and irritable cough followed immediately after injection. One hour afterwards patient had a rigor and Temp. at 6pm. was 104, Pulse 116. Through the night he perspired freely.

5. At 6am. Temperature was normal. Pulse 92.

6. Patient comfortable. Atoxyl grs. 2½ injected.

8. Temperature at 2pm. was normal. Tartar Emetic grs. 1. was injected constricting pain was only slightly felt and there was no cough or rigor afterwards. At 6pm. Temp. was 101. Pulse 99.

9. Patient comfortable. Atoxyl grs.2½ injected.

11. He complained of aching pains and tenderness in legs and thighs, chiefly felt at night. At 2pm. temp. was 99. At 2-30pm. Tartar Emetic, grs.1.was injected, slight pain and cough followdd and at 3-15pm., rigor: at 6pm. Temp. was 102 and Pulse 130 - pulse weak and very low tension: at 9pm. temp. was 100: through the night he slept well.

12. Patient still complained of pains in limbs: Knee jerks were absent. Atoxyl was injected, but reduced to grs.1½.

13_ Patient comfortable.

14. Towards evening he complained of pains in the limbs. Bact. Report:- No trypanosomes found.

15. Bact. Report:- Trypanosomes were present in blood.

Patient felt rather seedy: Temp. 100 at 10am. Pulse 90. Tartar Emetic injected at 2pm. No rigor followed: At 6pm. Temperature as 101. Through the night he perspired.

16. Atoxyl grsz 1½ injected.

17. Patient felt better.

18. Tartar Emetic, grs.1.was injected at 3pm., the Temp. being 99.2; there was no pain, cough or rigor afterwards: Temp. at 6pm. was 101.4: Pulse 108.

19. Atoxyl grs.1½ injected. Bact. Report:- No trypanosomes found in blood.

Differential count of blood was as follws:-

Polymorph	63%
Large mononuclear	9%
Lymphosytes	27%
Eosinophils	1%

Several pigmented mononuclear seen.

Patient having complained of dimness of vision, Oculist reported on condition of eyes as follows:- "The fundus of each eye "appears to be quite normal. The discs are a good colour and the dimness of vision is due to an error of refraction".

20. Patient comforable and eating well.

21. Felt sleepy and tired.

22. He did not feel well, but complained of nothing definite, only wanting to be left alone. Tartar Emetic, grs.1. was injected at 2pm. Temp. was 100: at 6pm. Temp. was 103: Pulse 96. Patient had a restless night.

23. Patient was easier in the morning. Atoxyl grs. 1½ injected.

24. Patient was much better.

Physical examination:-

HEART: No adventitious sounds. Right border ½" to right of Mid-Sternum. Left border in line with left nipple.

PULSE: 94, of low tension.

LUNGS: Normal.

LIVER: Normal.

SPLEEN: Palpable ½ inch.

GLANDS: One gland palpable and slightly tender behind each Sterno-Mastoid; no enlarged gland in axilla or groin.

GENERAL CONDITION: poor: decided loss of weight as evidenced by wasting of muscles and subcutaneous tissue in arms, legs and back.

No rash present: No localised oedema:

ABDOMEN: showed slight gaseous distension: no fluid present.

NERVOUS SYSTEM: Tactile sense - good: Hot and cold sense good. No deep hyeraesthesia present: No pains complained of in calves of legs or thighs: Knee jerks absent: No Ankle clonus: No Babinski: Eye reflexes normal: Urine - no albumen, no sugar.

1 25. At 10am. patient had a rigor, Temp. reaching 101: Tartar Emetic grs.1. was given at 2pm.

Bact. Report:- Trypanosomes were present in blood.

26. Patient comfortable. Atoxyl grs.1½ injected.

27. Patient complained of pain in left ear. No swelling was present in front or behind the ear and there was no discharge.

28. He felt seedy and still complained of pain in the left ear- on examination nothing abnormal was detected.

29. Temp. at 10am. was 99: At 11am. Tartar Emtic grs.1. was injected: Patient had a severe rigor ½ hour afterwards and at 2pm. temp. was 104,8: Pulse 130 and weak: In the afternoon he was retching and vomiting - the vomit was acid, slightly bilious but there was no blood: At 11pm. patient was very collapsed, pulse thready and uncountable; Strychnia and Digitalis were given hypodermically, and alcohol in the form of Champagne and Brandy by the mouth.

30. Stimulants had to be continued and intravenous saline was given in the morning and in the afternoon rectal saline with Brandy. Throughout the day vomiting continued, the vomit consisting chiefly of bile.

1. Hiccough commenced in the early morning and continued throughout the day; during the morning patient vomited once: tongue was thickly coated with fur; motions were loose and there was incontimence of the bowels: otherwise his general appearance was better: At 6pm. Temp. was 98 and Pulse 100: Pain was still complained of in the left ear: Mixture of Bismuth and Salol was given.

2. Hiccough stopped: patient felt sickly but otherwise better: Tongue was very furred: Bowels were loose and incontinent. Atoxyl grs.1½ injected. Bact. Report:- Trypanosomes were present in blood in large numbers.

3. Bowels still loose and incontinent: Stomach felt uncomfortable, patient feeling sickly but he did not vomit.

4. Bact. Report:- Trypanosomes found in blood. Patient was rather drowsy: No sickly feeling: In each groin three glands were palpable and slightly tender.

5. Atoxyl grs.2.injected. Patient was drowsy and not eating well.

6. Still drowsy and no desire for food.

7. It was proposed to patient to admininster Tartar Emetic again; this had been previously hinted at, but on both occasions patient refused to have it.

8. Atoxyl grs.2.injected.

9. Tartar Emetic grs.2½ given per Rectum; this was only retained half an hour.

Patient had been apathetic and listless ever since the big reaction to Tartar Emetic, but on being informed that he was to be shortly transferred to South Africa where his home was, he immediately seemed to take on a new lease of life, being brighter and more cheerful and was quite confident he would be alright once he arrived there.

10. Oedematous swelling about the ankles was noticed and fluid was present in the abdominal cavity: A mixture containing Digitalis and Diuretic was given.

11. Bact. Report:- Trypanosomes were found in the blood.

12 & 13. Patient is bright and more interested in things going on in the Ward.

14 & 16. Atoxyl grs.2.injected.

17. Oedema about ankles is a little better: no appreciable alteration in amount of fluid in abdomen.

18. Patient was transferred to Hospital Ship for transfer to S.A. Patient died two months later in South Africa, the chief cause being cardiac failure, as evidenced by increase of oedema.

Aug. 10/1918. Patient died.

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CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps A.S.C.M.T. No. 2381 Rank and Name Pte Sanderson G.W. Age 40 Service 19/12 Hospital Station D.S.M.

March

Disease Trypanosomiasis Date of Admission 10-3-18 Date of Discharge Result

Dates of Observation.	14			15			16			17			18			19			20			21			22			23		
Day of Disease.	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm
Temperature, Fahrenheit.	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10
	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.
	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.
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PULSE PER MINUTE												64				60 68	64 60	64 62	62 62	60 64	64 62	76 68	66 68	84 62	66 60	64 64	68	84 84	80 92	76 80
RESPIRATIONS PER MINUTE																														
Motions.																1	1	0	0	1	0	0	0	0	0	1	1	0	0	1

Trypanosomes + + 4-30 am 4-30 pm

4-30 am 4-30 pm

4-30 am

Intramuscular Inj. of Atoxyl grs III

Cal. grs III

Anæmia. Atoxyl grs III

Mag Sulph

Atoxyl grs III

Typhoid —

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps S. Rhem I. No. 2381 Rank and Name Pte Sanderson G.W. Age 40 Service 1912 Hospital Station Rhyl

Disease Trypanosomiasis Date of Admission 10-3-18 Date of Discharge Result

March

Dates of Observation.	24			25			26			27			28			29			30			31			April 1			2			
	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm	
Day of Disease.	2	6	10	2	6	10	2	6	10	2	6	10	2	6	10	2	6	10	2	6	10	2	6	10	2	6	10	2	6	10	
Temperature, Fahrenheit.	Time.			Time.			Time.			Time.			Time.			Time.			Time.			Time.			Time.			Time.			Time.
	A.M.	P.M.		A.M.	P.M.		A.M.	P.M.		A.M.	P.M.		A.M.	P.M.		A.M.	P.M.		A.M.	P.M.		A.M.	P.M.		A.M.	P.M.		A.M.	P.M.	
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Pulse per minute	80	76	98	88	68	72	82	76	86	82	72	108	74	70	70	76	72	76	76	72	96		94	82	92	84	88	88	100	86	
	78	78	84	74	76	84	84	78	84	76	80	88	78	72	78	76	74	74	74	76	116	64	100	96	84	92	90	92	98	100	
Respirations per minute																															
Motions.	1	1			1	1			1			1	1		1	1	1						1					1	1	1	

Trypo +

Intravenous Inj. of Tartar Emetic gr. ½

Rigor

Chloroform gr. iii

Tartar Emetic gr. ½

Rigor 3-30 P.M.

Chloroform gr. iii

CLINICAL CHART.

A. F. B181
Gratis.
15-2-10.

(To be attached to the case sheet.)

Corps S A S Cm L. No. 2381 Rank and Name Pte Sanderson G. W. Age 40 Service 19/12 Hospital Station D Sq

Disease Trypanosomiasis Date of Admission Date of Discharge Result

April

Dates of Observation.	3			4			5			6			7			8			9			10			11			12		
	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm	am		pm
Day of Disease.	2	6	10	2	6	10	2	6	10	2	6	10	2	6	10	2	6	10	2	6	10	2	6	10	2	6	10	2	6	10
Temperature, Fahrenheit.	Time.		Time.	Time.		Time.	Time.		Time.	Time.		Time.	Time.		Time.	Time.		Time.	Time.		Time.	Time.		Time.	Time.		Time.	Time.		Time.
	A.M.	P.M.	A.M. P.M.	A.M.	P.M.	A.M. P.M.	A.M.	P.M.	A.M. P.M.	A.M.	P.M.	A.M. P.M.	A.M.	P.M.	A.M. P.M.	A.M.	P.M.	A.M. P.M.	A.M.	P.M.	A.M. P.M.	A.M.	P.M.	A.M. P.M.	A.M.	P.M.	A.M. P.M.	A.M.	P.M.	A.M. P.M.
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Pulse per minute	102	100	96	82	96	114	86	80	80	94	84	84	84	96	94	90	84	99	88	94	92	88	100	98	96	98	130	86	86	88
	102	102	84	84	84	116	86	82	84	80	80	88	80	96	90	96	88		92	90	94		96	100		96	100		88	90
Respirations per minute																														
Motions.	1		1			1	1	1	1			2	1	1	1		1				1			1		1	1			

Typhoid +

Intravenous Inj of Tartar Emetic grs ½

Intramuscular Inj of Atoxyl grs iiss

Tartar Emetic grs ½

Atoxyl grs iiss

Tartar Emetic grs ½

Atoxyl grs iiss

CLINICAL CHART.

A. F. B181.
Gratis.
15-2-10.

(To be attached to the case sheet.)

Corps Salem L. No. 2381 Rank and Name Pte Sanderson G.W Age 40 Service 19/12 Hospital Station D.S.M.

Disease Trypanosomiasis Date of Admission 10-3-18 Date of Discharge Result

April.

Dates of Observation.	13			14			15			16			17			18			19			20			21			22		
	am		Pm	am		Pm	am		Pm	am		Pm	am		Pm	am		Pm	am		Pm	am		Pm	am		Pm	am		Pm
Day of Disease.	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10
Temperature, Fahrenheit.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.
	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.
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PULSE PER MINUTE	86	64 86	84 80	74	96 90	114	112	100	106 100	68	84 82	90 100	94	76 80	84	100		160 98	80 70	80 76	78 70	66	80 82	82	76	78 100	100	70 72	88	96
RESPIRATIONS PER MINUTE																														
Motions.		2					1			1				2				3												

Temperature curve annotations:
- 13: Typhoid +
- 14: Typhoid —
- 15: Typhoid +; Intravenous Inj. of Tartar Emetic gr. 1
- 16: Intramuscular Inj. of Novyl gr. 1/15
- 18: Tartar Emetic gr. 1
- 19: Intramuscular Inj. of Novyl gr. 1/15
- 22: Tartar Emetic gr. 1

CLINICAL CHART.

A. F. B181.
Gratis.
15-2-10.

(To be attached to the case sheet.)

Corps A.S.C.M.T. No. 2381 Rank and Name Pte Sanderson G.W. Age 40 Service 19/12 Hospital Station D.S.M.

Disease Trypanosomiasis Date of Admission 10-3-18 Date of Discharge Result

Dates of Observation.		am 23		Pm		am 24		Pm		am 25		Pm		am 26		Pm		am 27		Pm		am 28		Pm		am 29		Pm		am 30		Pm		May 1		Pm		am 2		Pm	
Day of Disease.		2 6		10 2		6 10		2 6		10 2		6 10		2 6		10 2		6 10		2 6		10 2		6 10		2 6		10 2		6 10		2 6		10 2		6 10		2 6		10 2	
Temperature, Fahrenheit.		Time.		Time.		Time.		Time.		Time.		Time.		Time.		Time.		Time.		Time.		Time.		Time.		Time.		Time.		Time.		Time.		Time.		Time.		Time.		Time.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
107°	8 6 4 2			Antipneumococcic Inj. of Aloxyl gr. 7½								Intravenous Inj. of Tartar Emetic gr. ¹/₁₅																															
106°	8 6 4 2																																						
105°	8 6 4 2																																						
104°	8 6 4 2																																						
103°	8 6 4 2																																						
102°	8 6 4 2									Typhus +																														
101°	8 6 4 2													Aloxyl gr. 7½																										
100°	8 6 4 2																									Tartar Emetic gr. ¹/₁₅														
99°	8 6 4 2																											H.I. Strych. gtt xx												
98°	8 6 4 2																													Intravenous Inj. of Saline Ot										
97°	8 6 4 2																													H.I. Strych. gtt xx to Digit. gr. ¹/₁₀₀										
	8 6																													Repeated at alternate hours										
Pulse per minute		84	92 104	102 100		98	94 98	88 86		80	92 104	98		88	86	84		76	80	84		84	100 104	104 96		84 180	120 28			112 128	120 120	76 120		72 96	104 120	100		100 88	102 86	96	
Respirations per minute																																								
Motions.								0		1								1					1	1			3				2		2	3	3				2	

CLINICAL CHART.

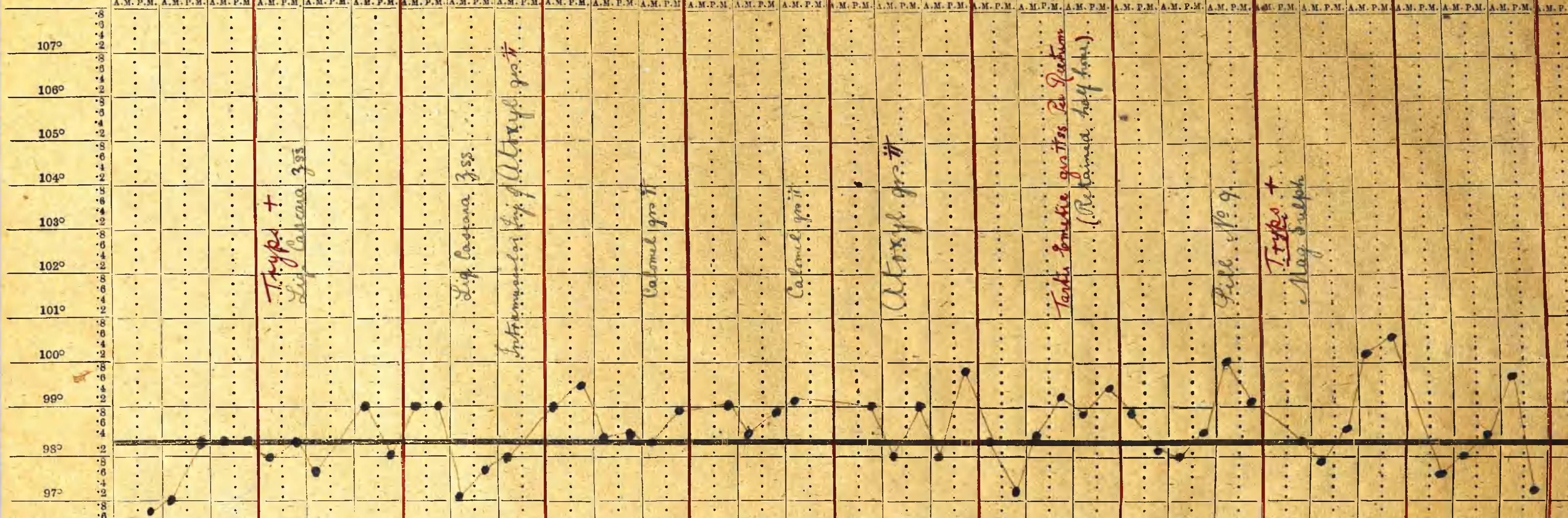
A. F. B181.
Gratis.
15-2-10.

(To be attached to the case sheet.)

Corps SASCMS No. 2381 Rank and Name Pte. Sanderson G.W. Age 40 Service 19/12 Hospital Station DSM

Disease Trypanosomiasis Date of Admission 10-3-8 Date of Discharge ______ Result ______

May



Dates of Observation (May)	Time (am 2, 6)	Time (10, 2)	Time (pm 6, 10)
3	Pulse: —	Pulse: 88 / 100; Motions: 0	Pulse: 96 / 96
4	Pulse: 88 / 96; Motions: 0	Pulse: 88	Pulse: 88 / 88
5	Pulse: 88 / 88	Pulse: 92 / 88; Motions: E.1	Pulse: 90
6	Pulse: 96 / 100	Pulse: 88 / 96	Pulse: 94 / 84; Motions: 1
7	Pulse: 84	Pulse: 88; Motions: 2	Pulse: 92; Motions: 2
8	Pulse: 96; Motions: 0	Pulse: 88	Pulse: 92 / 88; Motions: 0
9	Pulse: 88 / 88; Motions: 0	Pulse: 92 / 96	Pulse: 92 / 100
10	Pulse: 100 / 96; Motions: 0	Pulse: 96	Pulse: 104 / 100
11	Pulse: 96; Motions: 0	Pulse: 96 / 100; Motions: 1 / 1	Pulse: 104 / 120
12	Pulse: 96	Pulse: 104	Pulse: 108 / 120; Motions: 2 / 1

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181
Gratis.
15-2-10.

Corps Salem L. No. 2381 Rank and Name Pte Sanderson G.W. Age 40 Service 19/12 Hospital Station D.L.M.

Disease Trypanosomiasis Date of Admission 10-3-18 Date of Discharge Result

May

Dates of Observation.	am 13	Pm	am 14	Pm	am 15	Pm	am 16	Pm	am 17	Pm	am 18	Pm	am 19	Pm	am	Pm	am	Pm	am	Pm
Day of Disease.	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10	2 6	10 2	6 10					
Temperature, Fahrenheit.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.	Time.
	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.
107°																				
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104°																				
103°																				
102°																				
101°																				
100°																				
99°																				
98°																				
97°																				
Pulse per minute	108 96	96 112	108 100	96 96	100 92	112	96	92 104		108	118 116	104	96	100 120	124		104			
Respirations per minute																				
Motions.			1			1			1			1			1					

Intramuscular Inj of Novyl 1 cc

Calomel gr. Pills No. 9

Calomel gr. ii

Mag Sulph 3ii

Transferred to South Africa per Hospital Ship

Case 2.

PRIVATE MIDDLETON, A.

S.A. Road Corps.

No.66. Private A. Middleton. 1st. S.A.Road Corps.

TRYPANOSOMIASIS.

Previous to 1896 patient was a Sailor, when he had occasional attacks of Malaria, and once a venereal sore, which soon healed and no internal treatment was necessary.

From 1896 until 1914 he lived in South Africa, either in Cape Colony or the Transvaal but he was never in Rhodesia. During this time he kept quite well. Patient served in the German West Campaign.

He arrived at Dar-es-Salaam at the beginning of February, 1918, and proceeded to Port Amelia in the middle of March, going inland to Maheba. Early in April he had a slight attack of Malaria and he was treated with Quinine.

Whilst here patient remembers a Tsetse fly settling on his face, but did not feel any bite and does not know the date. His present illness dates from May 6. when he began to feel seedy, developing severe pains in all his joints and being feverish; he thought it was an attack of Malaria, but on the whole the pains were more severe this time than he had experienced previously

8 10. On May 10th. he was admitted to hospital at Port Amelia.

12 & 13. Blood examined microscopically for Malarial parasites, proved Negative.

16. Trypanosomes found in blood in large numbers.

He was given Liq. Arsenicalis, m,iii, three times a day after food.

21. Patient was transferred to Base Hospital, Dar-es-Salaam per Hospital Ship and was admitted to 84 British General Hospital on 25th. May, 1918.

Examination on Admission.

Patient states he feels alright, except that he has no energy and could not do any work, being easily tired.

General condition: Rather stout, debilitated and anaemic.

Tongue: Furred at back and on protruding a fine tremor is present.

15. Skin: No rash is present on body: no local oedema:

Glands: about the size of an almond are felt in the posterior triangle of the neck on the left side; no tenderness is complained of.

Smaller glands are palpable in the right posterior triangle. The left epitrochlear and left inguinal glands are enlarged. The glands were of medium consistence.

Nervous System: Memory is poor for recent events: Pupil reflexes Normal: Knee jerks Normal: No ankle clonus: No Babinski: No deep hyperaesthesia: epicritic sense and sense to hot and cold are normal.

Heart: Fatty, sounds being soft and muffled: Arteries sclerosed. Pulse 100, medium tension.

Spleen: Palpable 3", no tenderness.

Liver: Palpable 1", tender.

Urine: No Albumen, No sugar.

Treatment and Effects.

Atoxyl gr.3. was given intramuscularly in gluteal region.

An attempt was made to give Tartar Emetic gr.1. dissolved in normal Saline by direct intravenous injection, but no prominent vein could be obtained and there was no certainty the needle was in the vein, so the solution was given per rectum.

This was continued twice weekly until June 11., and was then discontinued as the Trypanosomes were not being controlled.

A vein was dissected out at the wrist and Tartar Emetic, gr.1. dissolved in Normal Saline was given intravenously; 15 minutes afterwards patient had a rigor and complained of severe pain in the Lumbar region; ½ hour later he vomited and 4 hours after the injection he was very collapsed.

Patient had rallied somewhat but was still sickly; evidence of stomatitis was present, the tongue being swollen and thickly coated with fur, and swelling of the lip was present.

Atoxyl grs.3. was injected.

Bacteriological Report: No trypanosomes found in blood.

He was still sickly but he felt better in himself: Stomatitis rather worse.

Still sickly and no desire for food; Tartar Emetic gr.1. was given intravenously - no pain or collapse afterwards.

16. Patient for 2 days had complained of pains in limbs; the Knee jerks were found to be absent so Atoxyl was reduced to grs.1½.

17. Still sickly and stomatitis troublesome.

Bacteriological Report:- Trypanosomes present.

18. Patient not so well; sickly; Pulse 110; tension low.

19. Mouth rather better although lip was swollen and sore.

Tartar Emetic, grs.1. given intravenously - there was a slight rigor one hour afterwards, also pain in bottom of back was complained of, but this soon passed off.

20. Patient comfortable; eating better. Atoxyl grs.1½ injected - ½ hour afterwards slight rigor with retching and slight pain in back. 2 hours afterwards he was comfortable.

Bact. Report:- Trypanosomes present.

21. Fairly comfortable. Complained of pains in legs. Lip normal size and mouth alright.

22. Tartar Emetic, gr.1. injected; followed by a slight rigor 20 minutes afterwards, retching and slight pain in back; in 2 hours after injection patient was comfortable.

23. Patient comfortable and eating well. Atoxyl grs.1½ injected.

Bact. Report:- No Trypanosomes present.

24 & 25. Keeping quite well.

26. Tartar Emetic, gr.1.injected - rigor ½ hour after intravenous injection, but only slight pain in back complained of and there was no Gastro-intestinal irritation.

27. Patient is comfortable and eating well. Atoxyl grs.1½ injected.

Bact: Report:- No Trypanosomes present, but Benign Tertian parasites found. Quinine Hydrochlor. grs.5 given every 3 hours.

28 Comfortable.

29. 2 cc. of solution of Antimon Oxide was injected subcutaneously - 2 hours afterwards felt nausea, but otherwise no ill effect.

30. Comfortable. Atoxyl grs.1½ injected.

Bact: Report:- Trypanosomes and Benign Tertian parasites present in blood.

Case II

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps 1st Road Corps. *No.* 66 *Rank and Name* Pte. Middleton. A. *Age* 52 *Service* 6/12 *Hospital Station* Port Amelia

Disease Trypanosomiasis *Date of admission* 11.5.18 *Date of* ~~Discharge~~ Transfer 21.5.18 *Result*

Dates of Observation.	May. 11	12	13	14	15	16	17.		18.		19.		20.		21.																			
Day of Disease.																																		
Temperature, Fahrenheit.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.m. P.M. 6 10	Time. P.m. P.M. 2 6	Time. A.m. P.M. 6 10	Time. P.m. P.M. 2 6	Time. A.m. P.M. 6 10	Time. P.m. P.M. 2 6	Time. A.m. P.M. 6 10	Time. P.m. P.M. 2 6	Time. A.m. P.M. 6 10	Time. P.m. P.M. 2 6	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
107°																																		
106°																																		
105°																																		
104°	On admission				2.30 p.m.																													
103°																																		
102°																																		
101°																																		
100°																																		
99°																																		
98°																																		
97°																																		
Pulse per minute							84 84	88 —	92 88	84	96 80	104 104	100 80	80 84	100 92	92																				
Respirations per minute																																		
Motions.	/	6 1	1 2	2 2	2 2	1 1	1 2	2 0	1 0	0 2	0 1	0 1	2 2	1 4	2 0	/																		

Transferred to Hospital Ship

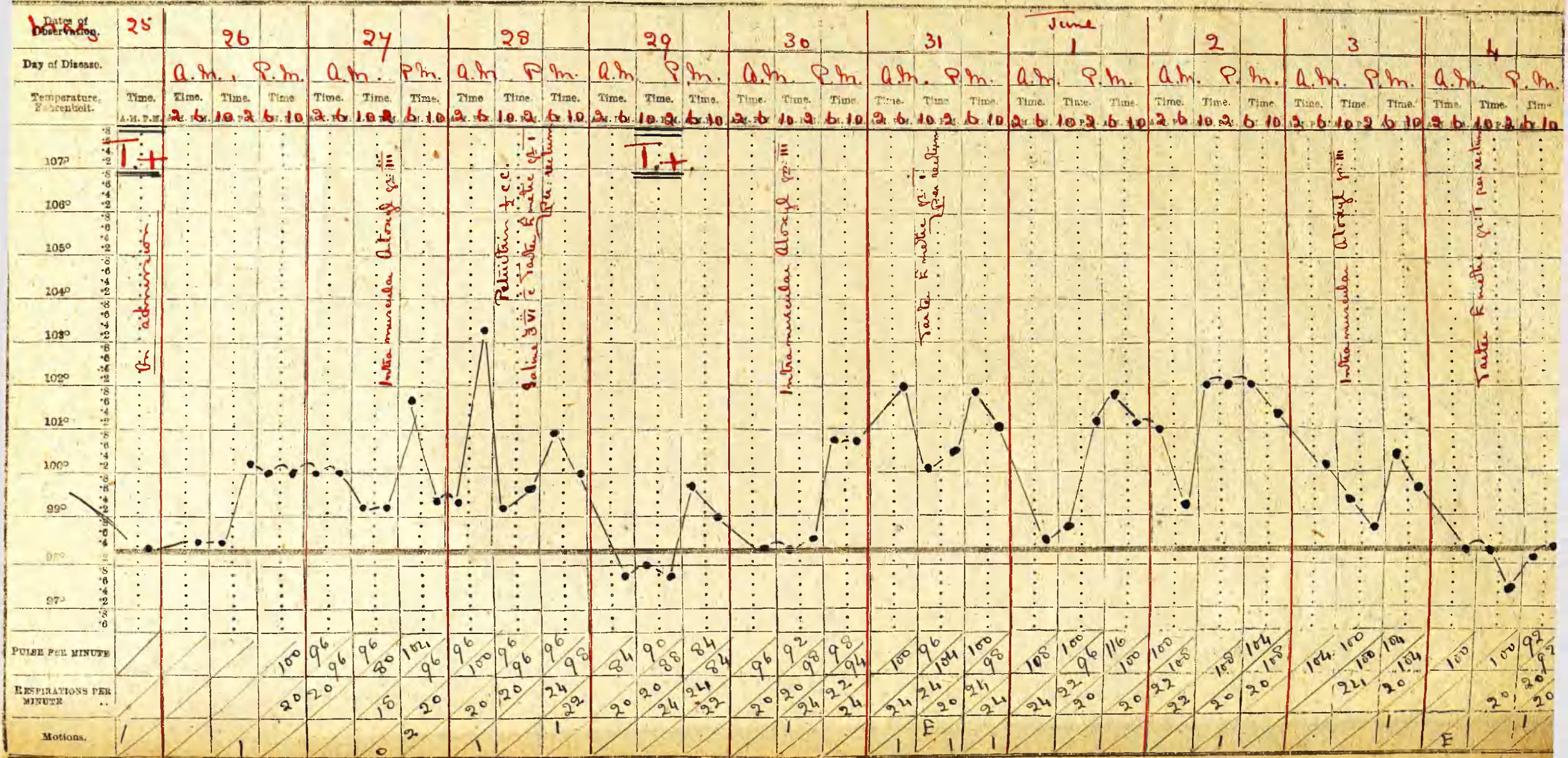
CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps 1st Road Corps No. 66 Rank and Name Pte. Middleton A. Age 52 Service 4/12 84th B.F.H. Hospital Station Dar-es-Salaam

Disease Trypanosomiasis Date of admission 25. 5. 18 Date of Discharge Transfer 1. 7. 18 Result



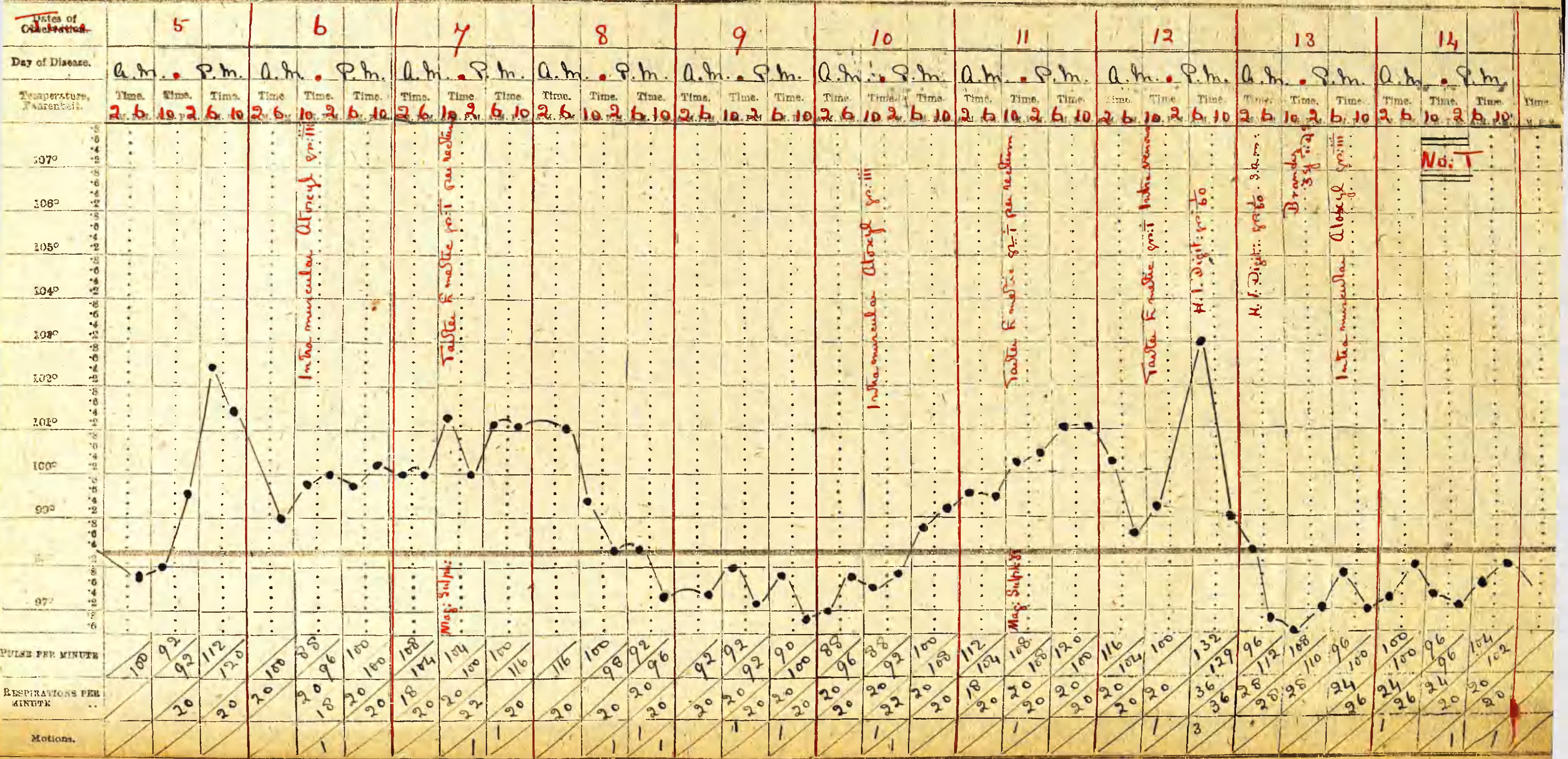
A. F. B181.
Gratis.
15-2-10.

CLINICAL CHART.

(To be attached to the case sheet.)

Corps 1st Road Corps *No.* 66 *Rank and Name* Pte: Middleton A. *Age* 52 *Service* 7/12 *Hospital Station* Dar-es-Salaam

Disease Trypanosomiasis *Date of admission* 25. 5. 15 *Date of* ~~Discharge~~ Transfer 1.7. 15 *Result*



CLINICAL CHART.

(To be attached to Case Sheet.)

Army Form B. 181.

Corps 1st S.A Road Corps — Military Hospital 84th B.G.H

No. 66 — Rank and Name Pte Middleton A. — Age 52 — Service 7/12

Disease Trypanosomiasis — Date of admission 25·5·18 — Date of ~~discharge~~ transfer 1·7·18 — Result

Dates of Observation: June 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24

Days of Disease

Temperature Fahrenheit

107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°

T+ T+ T—

Intravenous Tartar Emetic gr i

Intramuscular Inj. Atoxyl gr i/2

Morphia gr ¼ under tongue

Intramuscular Inj. Atoxyl gr i

Intravenous Tartar Emetic gr i

Intramuscular Inj. Atoxyl gr i

Intravenous Tartar Emetic gr ½

Intramuscular Inj. Atoxyl gr i

Cal gr i

	15 AM	15 PM	16 AM	16 PM	17 AM	17 PM	18 AM	18 PM	19 AM	19 PM	20 AM	20 PM	21 AM	21 PM	22 AM	22 PM	23 AM	23 PM	24 AM	24 PM	25 AM
Time	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6
Pulse per Minute	88 88	92		88 100	104 98	90 90	110 120	116 116	108 100	104 120		108	90 122	120 116	120 116	110 98	108 92	92 92	84 76	90 88	84 88	76 90	94 116
Respirations per Minute	20 24	22		20	20 20	20 18	24 24	25 20	32 20	20 20			26 24	32 26	24 24	22 18	16 18	20 20	20 24	18 24	16 24	18 ·	16 20
Motions per 24 hours	/	1 /	1 /	· /	· /	1 /	· /	· /	1 /	· /	· /	· /	· /	· /	· /	· /	· /	· /	· /	1 /	· /	· /	· /

	26 AM	26 PM	27 AM	27 PM	28 AM	28 PM	29 AM	29 PM	30 AM	30 PM	1 AM	1 PM	2 AM	2 PM	3 AM	3 PM	4 AM	4 PM	5 AM	5 PM	6 AM
Time	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6 10	2 6
Pulse per Minute	92 92	90 88	92 88	84 92	58 90	90 92															
Respirations per Minute	16 18	20 16	20 16	16 18	18 20	18 16															
Motions per 24 hours	· /	1 /	· /	· /	1 /	· /															

CLINICAL CHART.

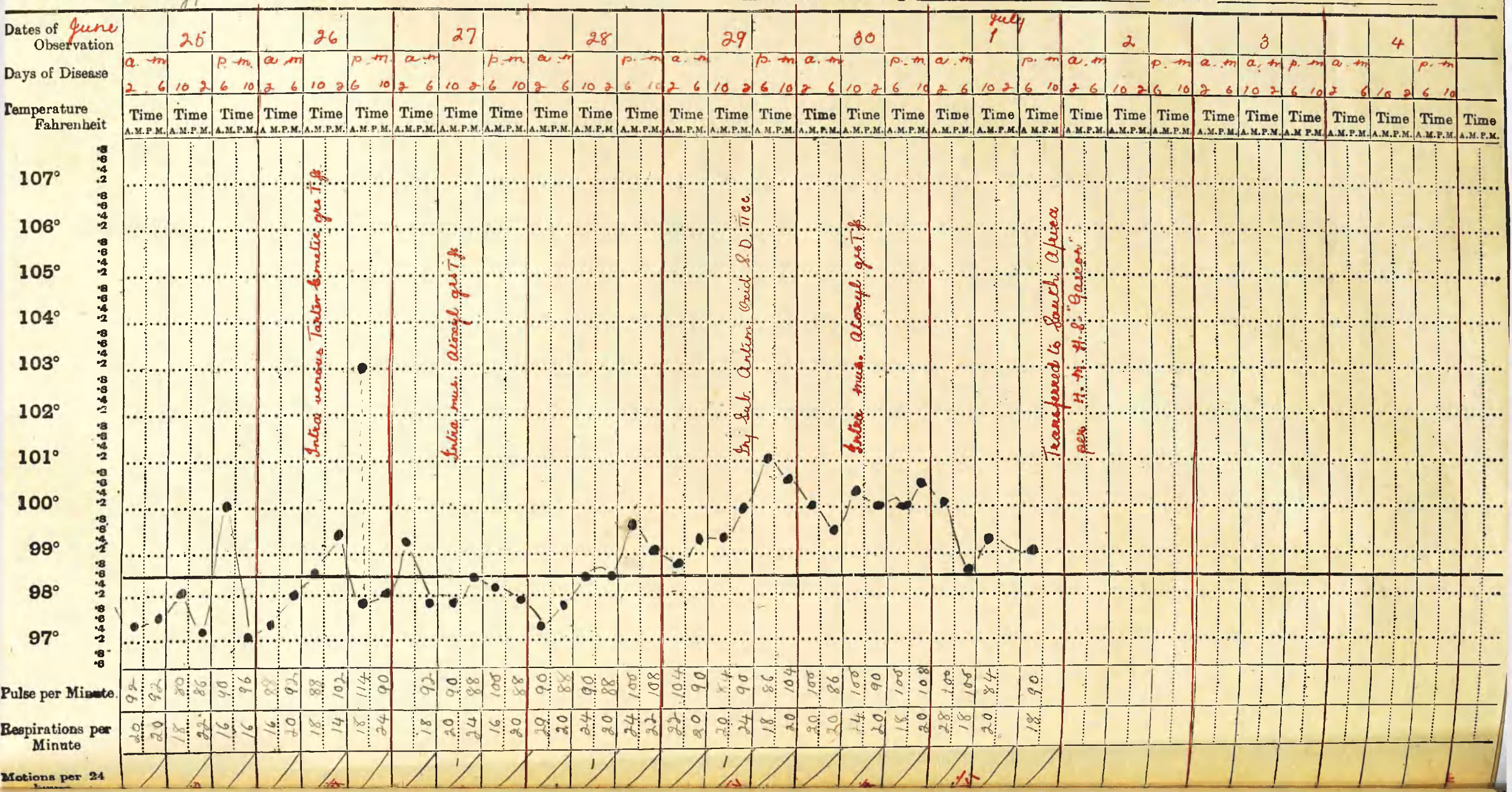
(To be attached to Case Sheet.)

Army Form B. 181.

Corps 1st S. A. Road Corps. Military Hospital 84th General Hospital Dem.

No. 66 Rank and Name Pte. Middleton A. Age 52 Service 7/12

Disease Trypanosomiasis Date of admission _____ Date of discharge _____ Result _____



Case 3.

549802. SAPPER R.MONK.

R.E. Telegraphs.

No.549802. Sapper E. M O N K., R.E.Telegraphs.

Age. 20. Service 9 months.

Disease. TRYPANOSOMIASIS.

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en.Hosp. essalam. 13/18. Patient landed in East Africa on October 1st., 1917 and was stationed at Daressalam until March 21st. when he proceeded to Port Amelia. On April 1st. he went to Ankuabe, about 40 miles inland.

Patient did not experience any sickness until the end of April. Whilst in Camp at Meza, during the first night he was unable to use his mosquito net properly, being obliged to lie in th-e open on the ground. The following day he had no appetite and felt feverish; the next day he was better: on the third day he suffered from severe frontal headache and giddiness, he felt feverish and on reporting sick he was admitted to Hospital. He was treated as Malaria and discharged in the second week of May.

Patient was sent on duty to a station 10 miles beyond Meza - a small stream and a pond were about 250 yards from the Camp. Plenty of flies were present during the day, but he never saw a Tsetse fly and was never bitten, it was cold at night and there were few mosquitoes. For 100 yards around, the Camp had been cleared of bush.

After his discharge from hospital patient kept well for five weeks, except for one night when he was a little feverish and had pains in head; he took Aspirin, grs.5. and on the following morning felt alright.

Whilst here patient ran alternate days on a motor bicycle to Ankuabe, 25 miles distant; he never saw any flies.
On one journey in the middle of June, he had to stop and repair the machine and in doing so made a skin deep cut on the first finger of the left hand. At the time he paid no attention to this but in the evening felt stiff in the elbow and armpit. On the following day he reported sick at the Camp Hospital and the arm was treated with fomentations. He was detained four days at the Camp Hospital; at night he was feverish and unable to sleep, patient felt a burning sensation all over body, had pains in the left arm and severe pain in the

head.

22. He was transferred to Ankuabe where fomentations were continued. Whilst at Ankuabe patient ate solid food well and does not remember being feverish.

27. Patient was transferred to 19th. Stationary Hospital, Port Amelia - chart shows subsequent course of Pyrexia.
Blood examination - negative.

28. " " Benign Tertian.
Patient was treated with Quinine - no effect on Temperature and temperature chart did not show tertian periodicity.

3. Blood examination - Trypanosomes present.
"Has small palpable glands in triangles of neck, in both axillae "and in groins".

5. "Small irregular patches of superficial erythema were visible on "chest wall".

DIET.		TREATMENT.
Beef Tea.	July 4-7.	Q. Hydrochl. grs.30.
Jelly.	" 8.	Q.H.grs.30. Tabs. Soamin gr.1.
Eggs.		Bis. die. p.c.
Chicken Essence.	" 9.	Q.H.grs.30. No. Soamin.
	" 10.	do. Rep. Soamin.

Patient vomited occasionally - generally after a dose of Quinine or Mag. Sulphate.
Apart from being feverish he felt alright whilst at Port Amelia.

11. He was transferred to H.M.H.S."Dongola" and disembarked at Daressalam on July 13th., being admitted to 84th. British General Hospital.

13. On admission patient complains of no pain and is comfortable. Appetite variable, sometimes good and at other times poor.
He says he has lost weight lately.
General Condition. Poor physique. Anaemia slightly: No localized oedema: No rash detected: body fairly well nourished: Muscles flabby. In both posterior triangles of neck enlarged glands are detected; the glands are about the size of a coffee bean, of medium consistence and are not tender, although the patient says they

have been tender. No gland is present in the right axilla, but a gland the size of an almond is present in the left axilla - this gland is tender.

Glands are enlarged in both groins in the Transverse group - those in the left are not tender, but tenderness is present in glands of right groin.

Epitrochlear glands are not palpable.

Memory rather poor lately.

Heart No adventitious sounds: no enlargement.

Pulse 96: low tension.

Lungs. Normal.

Spleen Palpable hlaf inch: tender.

Liver Normal.

Nervous system. Patient has noticed his memory has been poor lately. Deep hyperaesthesia is a marked symptom - tapping him over the shin bones causing him to winee; this is present also in th e upper limbs, but to a lesser degree.

Knee reflexes - active.

Plantar Reflex - slightly more active than normal: no Babinski present.

Ankle clonus - not present.

Testing tactile sense as judged by stroking the skin with a piece of cotton wool - this was absent below the Tibial Tuberosities, but over the rest of the body it was present and in some places the sensation produced was excessive, causing local twitching of the muscles.

Hot and cold test - normal.

Testing with pricking with 2 needles held apart.

Sensation was less in the lower limbs - taking the axis transversely to the limbs he appreciated two points at a distance of 1½" and in the length of the limb it varied from 2 to 2½".

Eye reflexes - normal. No nystagmus present.

13. Patient was comfortable and had no complaint.
Bacteriological Report:- Trypanosomes present in blood: No Malarial parasites.

14. Comfortable.

15. Tartar Emetic grs.1. injected intravenously at 9-30p.m. - no immediate effects apart from complaining of pain in arm and headache. Temperature rose from 101 to 104: towards evening he was quite comfortable.

16. Atoxyl grs.3. injected intramuscular.
Bacteriological Report: No Trypanosomes.
Comfortable during the day but rather drowsy.

17. Patient complains of feeling a little dizzy and is drowsy.

18. Tartar emetic gr.1. given intravenous - rigor ¾ hour after injection Temperature rose from 99 to 103: no complaint of pain afterwards.

19. Atoxyl grs.3.injected intramuscular: Still drowsy.
Bact. report:- Trypanosomes present.

20. Patient did not sleep very well on account of a burning sensation through body.

21. Febrile: thirsty: pulse 112 per minute, weak and low tension: Memory bad: drowsy:

22. Tartar Emetic grs.1.given - slight rigor 20 minutes afterwards, otherwise comfortable.

23. Atoxyl grs.3.injected. Comfortable but slight numbness in legs complained of. Bact. report:- Trypanosomes present.

24. Knee jerks are slightly increased: Plantar reflexes are very active: Deep hyperaesthesia is not so marked: No rash detected: Patient is very emaciated: otherwise is comfortable and has no pain.

25. Tartar Emetic grs.1.given - rigor 3 hours after injection and patient complained of pain in shoulder and arm.

26. Atoxyl grs.3.injected - left arm is stiff at the elbow but there is no local swelling. Bact. Report:- Trypanosomes present.

&28. Patient comfortable.

29. Tartar Emetic grs.1.administered & rigor 1 hour afterwards.
He complained of no pain and felt comfortable apart from feverishness.

30. Atoxyl grs.3.injected.
Bact. Report:- Trypanosomes not present.

31. Patient comfortable.

1. Tartar Emetic grs.1. given- no rigor or discomfort afterwards.

2. Atoxyl grs.3.injected. Patient feels well and is eating well: Kerendels symptom less marked: Tactile sense improved: Knee jerks very active: Plantar reflex - flexor and active: No rash. Bact. Report: Trypanosomes not found.

3 & 4. Patient comfortable and taking food well.

5. Tartar Emetic grs.1.given - while giving the injection he complained of pain in the same shoulder: 20 minutes afterwards had rigor, temperature reaching 103.

6. Atoxyl grs.3.given. Patient comfortable, pulse 90, tension low. Bact. Report: Trypanosomes present, but scanty.

7. Tongue clean: General appearance good: Pulse 84: Heart Normal: Lungs Normal. He complains of a feeling of deadness in both feet- feet are normal in appearance: Plantar reflex active: deep hyperaesthesia is not elicited. Knee jerks active: No rash.

8. Tartar Emetic grs.1.given - no rigor afterwards and no pain. Seen by Col. Newham, R.A.M.C. who recommended increasing Tartar Emetic to grs.2.

9. Atoxyl grs.3.injected. Patient comfortable.
Bact: report: Trypanosomes not ~~found~~ present.

10 &11. Patient comfortable.

12. Tartar Emetic grs.2.given - immediately afterwards patient had a slight irritating cough: 15 minutes later rigor; Temperature rising to 104.8: Vomited soon after rigor; later complained of frontal headache.

13. Atoxyl grs.3.injected. Bact. Report:- Trypanosomes present.

14. Pulse 99: tension improving, not quite so low as when admitted: No pain: eating well.

15. Tartar Emetic grs.2. given - severe rigor 2 hours afterwards: Temperature rose to 105; patient complained of pain in front of head.

16. Atoxyl grs.3.injected. Bact. Report:- Trypanosomes present.

17. Knee reflexes active: Plantar reflex - flexor: Epicritic sense normal in legs: No deep hyperasthesia.

18. Patient comfortable: Pulse 96, moderate tension.

19. Tartar Emetic grs.2.given - immediately after injection a short irritable cough commenced and lasted 2 minutes: No rigor.

20. Atoxyl grs.3.injected. Patient comfortable.

Bact. Report:- No Trypanosomes found.

21. Patient comfortable.

22. Tartar Emetic grs.2. given - Cough commenced immediately following injection and continued 5 minutes: No rigor.

23. Diarrhoea - probably due to eating fruit.

Atoxyl grs.3. injected. Bact. Report:- No trypanosomes found.

& 25. Patient comfortable.

26. Tartar Emetic grs.2.injected - No rigor after injection.

27. Atoxyl grs.3.given. Bact. Report:- Trypanosomes present.

28. Patient complained of pain in head. Temperature rose in the evening to 103.2. Glands palpable in right and left posterior triangles and in right and left groin; they vary in size from a pea to an almond and are slightly tender: gland in left axilla is barely palpable and is not tender: no epitrochlear glands felt: Spleen is not palpable. Bact. Report:- Trypanosomes present.

29. Patient more comfortable, no headache, Temperature at 10a.m. 100. Tartar Emetic grs.2½ given - A slight cough after injection: rigor 1 hour afterwards: he did not complain of any pain.

30. Atoxyl grs.3.injected.

Nervous system - physical examination.

No deep hyperaesthesia: Epicritic sense not quite as good as on Aug 17/18, but much better than when admitted. Hot and cold test good. Tests of appreciation of two sharp points similar result as when admitted: Knee jerks active: No ankle clonus: Plantar reflex - flexor.

31. Patient comfortable. Feeling well. In the afternoon he had pain in front and top of head. Temperature rose to 101.

1. Patient comfortable. Bact. Report:- No Trypanosomes found.

2. Tartar Emetic grs.2½ given - Severe fit of coughing immediately followed injection: No other effect.

3. Atoxyl grs.3. injected.

4. Patient comfortable. Bact. Report:- No Trypanosomes found.

5. Tartar Emetic grs.2½ given - No rigor, but temperature rose to 102. ~~Other manifestations in connection with the nervous system, e.g. - deep hyperaesthesia and epicritic sense &c.,~~

were practically normal.

6. Atoxyl grs.3.injected. Bact. Report:- Many Trypanosomes present

7. Patient comfortable and eating well.

8. Tartar Emetic grs.2½ injected: No rigor but temperature rose to 102.5. and patient complained of frontal headache. Blood film taken before injection showed Trypanosomes present.

9. Patient was evacuated per Hospital Ship for transferrence to England. His condition was greatly improved as compared with his condition on admission, July 13/18. This improvement was most marked as regards his mental outlook, the patient being brighter and more interested in himself and his surroundings. Other manifestations in connection with the nervous system, e.gz deep hyperaesthesia and epicritic sense &c., were practically normal. His general appearance was much better, being fuller in the face and body, and he had certainly gained weight. The tension of the pulse was improved as compared with the tension on admission. No oedema was present and no rash.

ADDENDA.

Monk was transferred to the Seamen's Hospital, London. He was doing all right until he contracted influenza with pneumonia in the beginning of November, 1918 and he died in 4 days time.

Case III

CLINICAL CHART.

(To be attached to Case Sheet.)

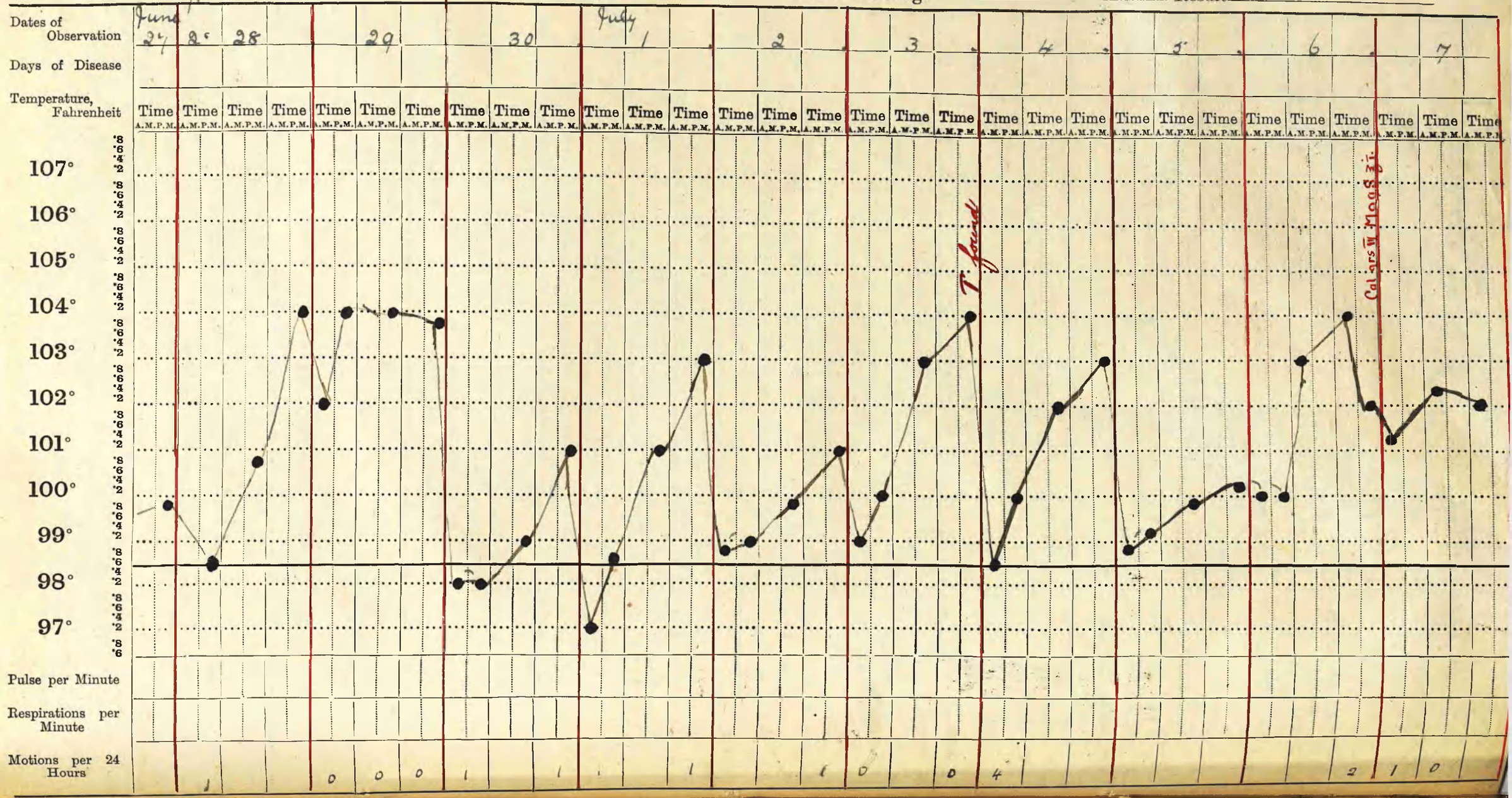
Army Form B. 181.

Corps R.E. Trds

Military Hospital 19th R. S. Military Hospital. Port Amelia.

No. 348902 Rank and Name Spr Monk R Age 20 Service 9/12

Disease Trypanosomiasis Date of admission 13.7.18 Date of discharge Result



CLINICAL CHART.

(To be attached to Case Sheet.)

Army Form B. 181.

Corps R. E. Tels — Military Hospital 84th. Brit. Gen.

No. 54890? — Rank and Name Spr. Monk R. — Age 20 — Service 9/13

Disease Trypanosomiasis — Date of admission 13. 7. 18 — Date of discharge — Result

Dates of Observation	July 8 A.M.	8 P.M.	9 A.M.	9 P.M.	10 A.M.	10 P.M.	11 A.M.	11 P.M.	12 A.M.	12 P.M.	13 A.M.	13 P.M.	14 A.M.	14 P.M.	15 A.M.	15 P.M.	16 A.M.	16 P.M.	17 A.M.	17 P.M.
Days of Disease	2 6	10 2 6 10	2 6	10 2 6 10	2 6	10 2 6 10	2 6	10 2 6 10	2 6	10 2 6 10	2 6	10 2 6 10	2 6	10 2 6 10	2 6	10 2 6 10	2 6	10 2 6 10	2 6	10 2 6 10
Temperature, Fahrenheit	Time A.M. P.M.																			
Pulse per Minute											100	92	100	88	96	108	104	96	88	100
Respirations per Minute											20	16	20	24	24	24	28	28	20	30
Motions per 24 Hours								1		E 1										

Emb. "Dorgold"

Simple Enema

Disenth. "Asm" T+

2 x Nock

2 x Nock

S.E. Good Result

Intravene Injection Tartar Emet. Mc. gr. I.

T-

Asthma

Int. Inj. Akoxyl grs. iii

Dates of Observation	17 P.M.
Days of Disease	2 6 10
Temperature, Fahrenheit	Time A.M. P.M.
Pulse per Minute	104 106 108
Respirations per Minute	20 30 18
Motions per 24 Hours	1 1

CLINICAL CHART.

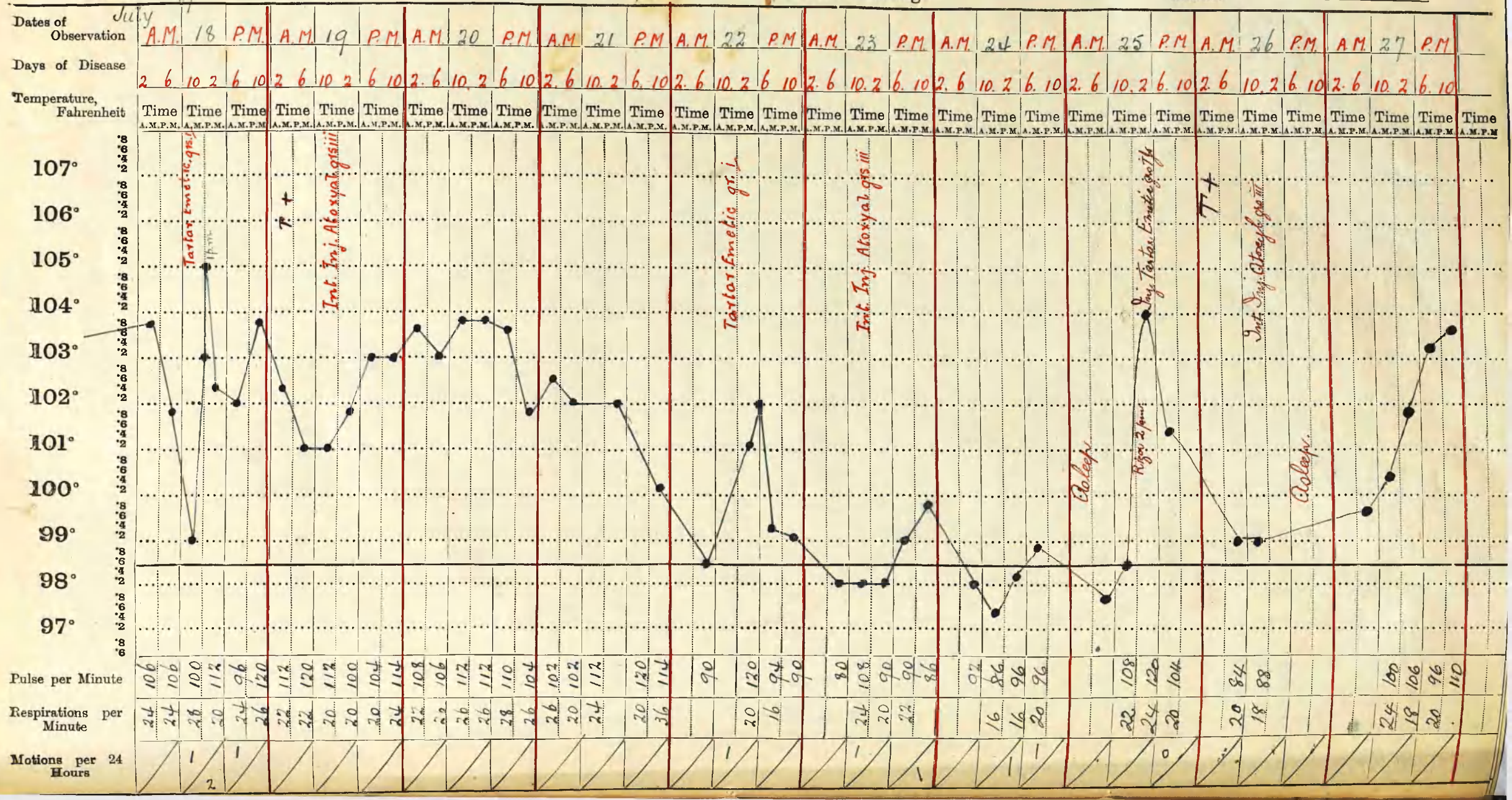
(To be attached to Case Sheet.)

Army Form B. 181.

Corps R. E. Tels. Military Hospital

No. 548902 Rank and Name Spr. Monk R. Age 20 Service 9/12

Disease Trypanosomiasis Date of admission 13. 7. 18 Date of discharge Result



Army Form B. 181.

CLINICAL CHART.

(To be attached to Case Sheet.)

Corps: R. E. Tele

Military Hospital: 84th B.G.H. Dhan

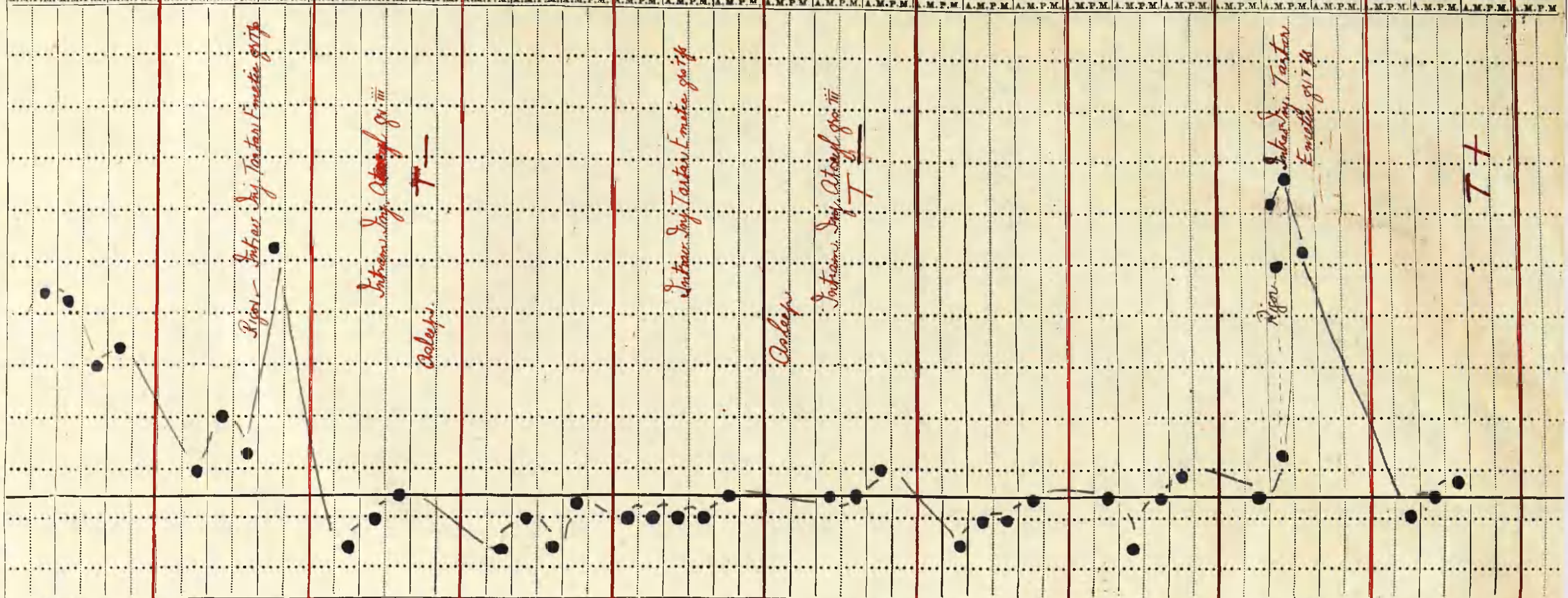
No. 548902 Rank and Name: Spr. Monk R. Age: 20 Service:

Disease: Trypanosomiasis Date of admission: 13.7.18. Date of discharge: Result:

Dates of Observation: July 28 (AM, PM), 29 (AM, PM), 30 (AM, PM), 31 (AM, PM), August 1 (AM, PM), 2 (AM, PM), 3 (AM, PM), 4 (AM, PM), 5 (AM, PM), 6 (AM, PM)

Days of Disease: 2 6 10 2 6 10 (each day)

Temperature, Fahrenheit — Time A.M. P.M.



Date	Pulse per Minute	Respirations per Minute	Motions per 24 Hours
July 28	120, 108, 104, 104	22, 20, 20	E1
29	100, 118, 100, 116	24, 18, 20	
30	88, 90, 96	18, 20	
31	88, 90, 96	18, 20	2
August 1	88, 90, 86, 90	20, 24, 22	
2	1, 100, 84, 106	20, 26, 22	
3	84, 96, 100, 98	20, 22, 20	1, 1
4	80, 100, 88, 96	22, 20, 19	1
5	100, 120, 128	22, 24, 30	
6	40, 86	20, 20	

CLINICAL CHART.

(To be attached to Case Sheet.)

Army Form B. 181.

Corps R.E. Tels

Military Hospital 84th B.G.H. Dsm

No. 548902 Rank and Name Spr. Monk R. Age 20 Service 9/12

Disease Trypanosomiasis Date of admission 13.7.18 Date of discharge Result

Dates of Observation: 7 (request.) 8 9 10 11 12 13 14 15 16

Days of Disease

Temperature Fahrenheit

Pulse per Minute

Respirations per Minute

Motions per 24 hours

Inst. Inj. TARTAR. EMETIC. grs. II

Inst. Inj. ATOXYL. grs. III

Inst. Inj. TARTAR. EMETIC. grs. II

Inst. Inj. ATOXYL. grs. III

Inst. Inj. TARTAR. EMETIC. grs. II

Inst. Inj. ATOXYL. grs. III

CLINICAL CHART.

(To be attached to Case Sheet.)

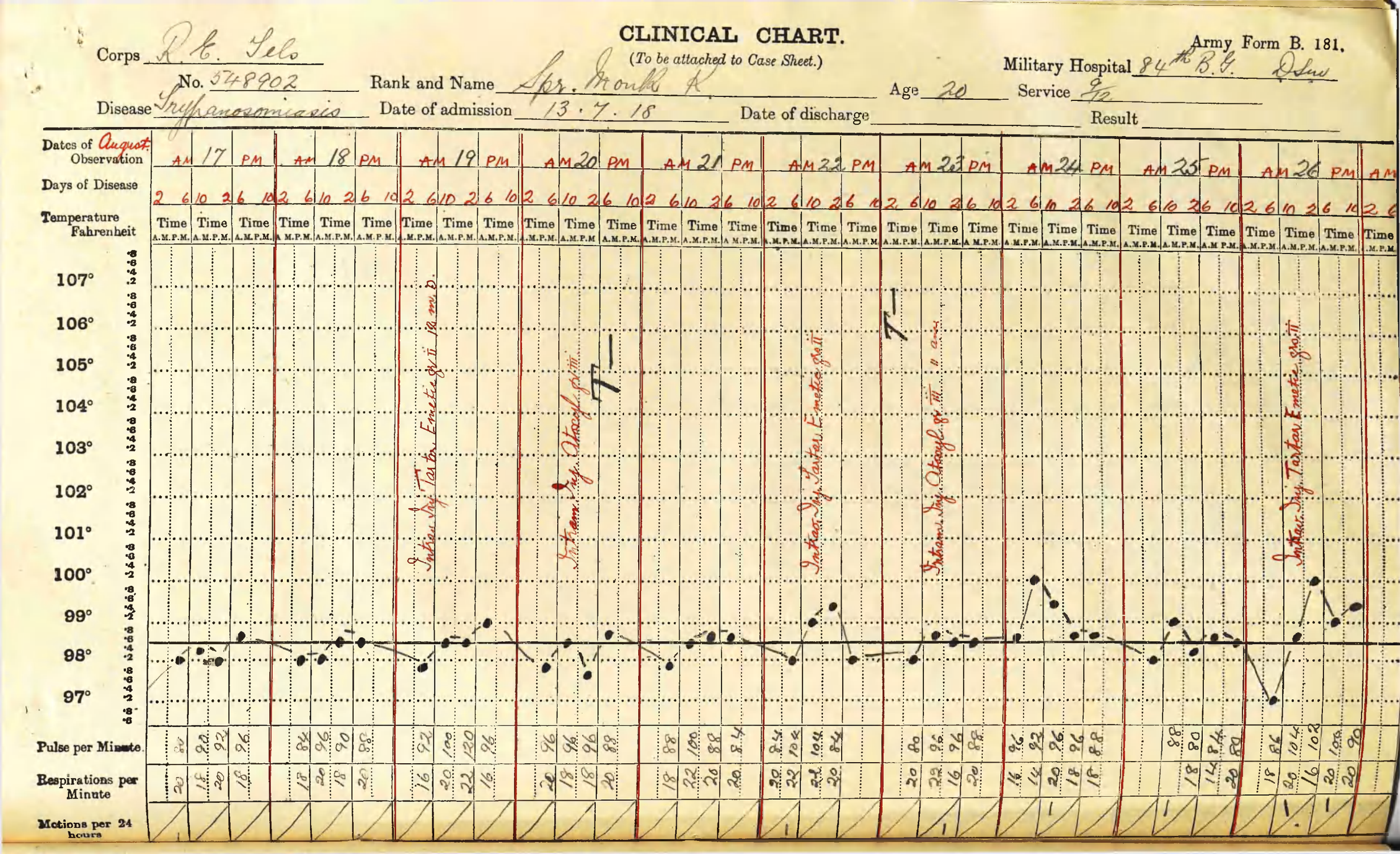
Army Form B. 181.

Corps R. E. Sels

No. 548902 Rank and Name Spr. Monk K. Age 20 Service Sp.

Military Hospital 84th B.G. Dsw

Disease Trypanosomiasis Date of admission 13.7.18 Date of discharge Result



Army Form B. 181.

CLINICAL CHART.

(*To be attached to Case Sheet.*)

Corps R. E. Sels. Military Hospital 84th B. G. Dsm.

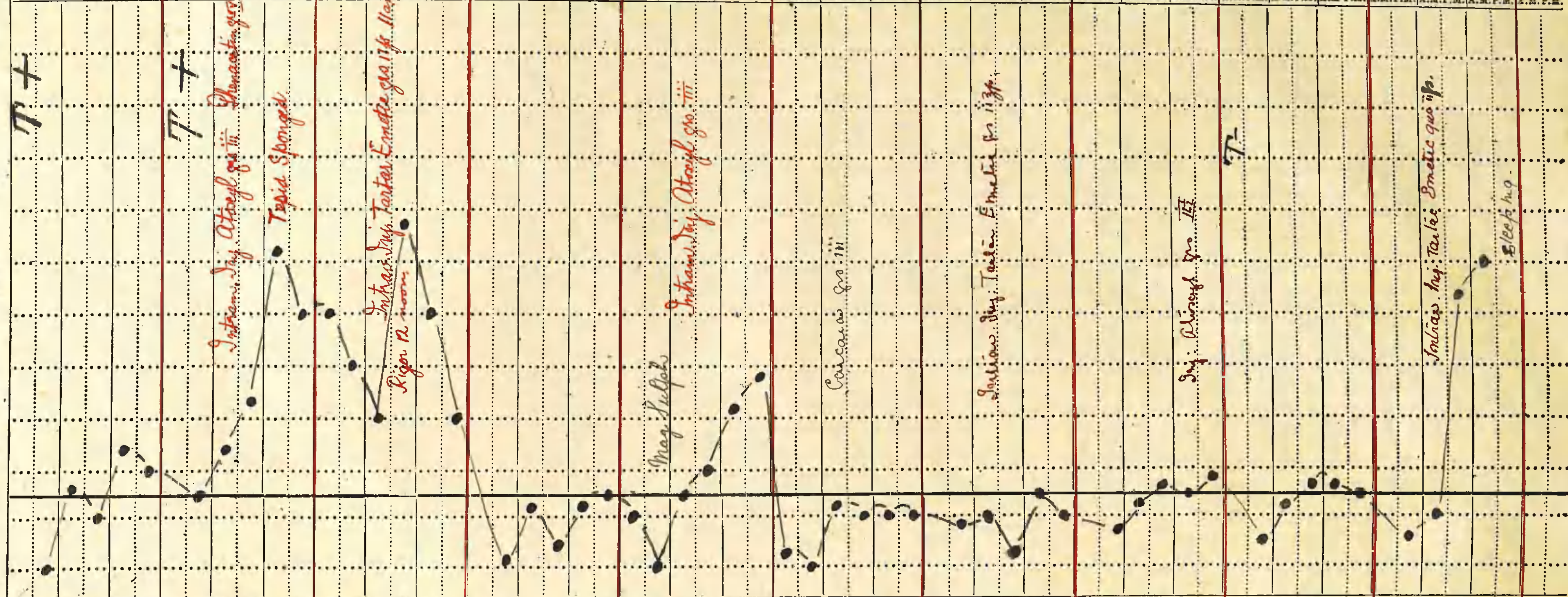
No. 548902 Rank and Name Spr. Monk K. Age 20 Service 9/12

Disease Tryfanosomiasis Date of admission 13. 7. 18 Date of discharge ______ Result ______

Dates of Observation: August 27, 28, 29, 30, 31; Sept. 1, 2, 3, 4, 5 (AM / PM)

Days of Disease: 2 6 10 2 6 10 (each day)

Temperature Fahrenheit: 97° – 107° (Time A.M. P.M.)



Date	Pulse per Minute	Respirations per Minute
Aug. 27	86, 104, 100, 96, 92	18, 20, 20, 22, 20
Aug. 28	90, 108, 120, 128, 126	20, 20, 24, 20, 24
Aug. 29	120, 120, 104, 128, 106, 110	24, 24, 24, 24, 18, 20
Aug. 30	102, 96, 86, 78, 92	18, 20, 16, 18, 20
Aug. 31	90, 84, 100, 100, 104, 160	18, 18, 18, 18, 24, 20
Sept. 1	96, 96, 92, 74, 88, 90	20, 20, 20, 14, 20, 20
Sept. 2	88, 84, 68, 92, 88	18, 18, 20, 20, 18
Sept. 3	80, 94, 92, 88, 90	18, 16, 16, 18, 20
Sept. 4	80, 80, 88, 84, 90	18, 18, 18, 16, 18
Sept. 5	88, 120, 120	18, 24, 24

Motions per 24 hours

CLINICAL CHART.

A. F. B181
Gratis.
15.2.10.

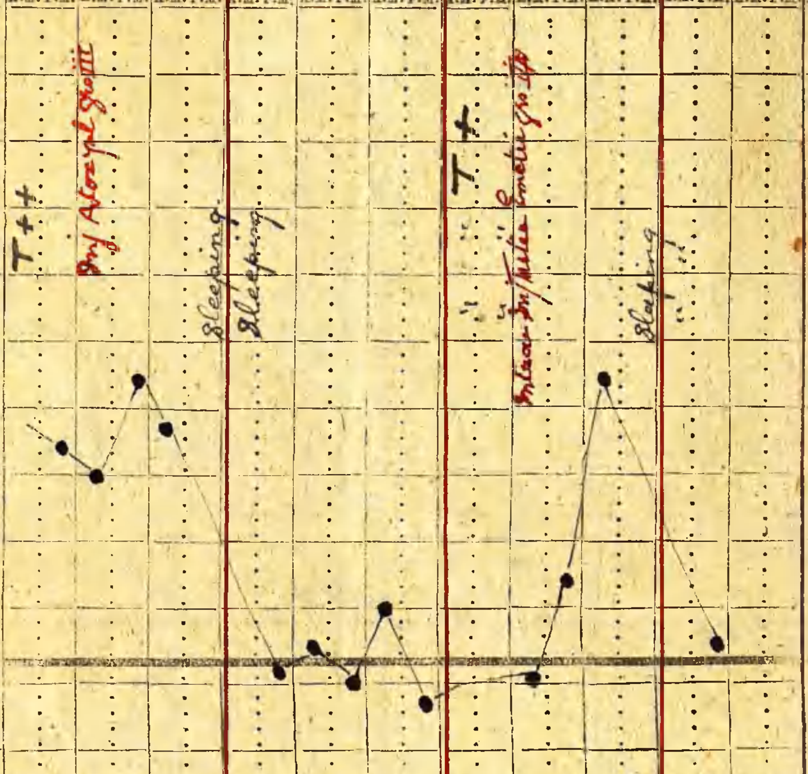
(To be attached to the case sheet.)

Corps R. E. Tels No. 548902 Rank and Name Spr Monk. R. Age 20 Service 9/12 Hospital Station 84th Gen. Dar-es-Salaam

Disease Trypanosomiasis Date of admission 13.7.18 Date of Discharge ______ Result ______

Dates of Observation	Sept 6			7			8			9			10			11			12			13			14			15			
Day of Disease (Time)	2.6	10.2	6.10	2.6	10.2	6.10	2.6	10.2	6.10	2.6	10.2	6.10	2.6	10.2	6.10	2.6	10.2	6.10	2.6	10.2	6.10	2.6	10.2	6.10	2.6	10.2	6.10	2.6	10.2	6.10	2.6
Pulse per minute	116	110 / 120	108	104	104 / 88	92 / 112		112 / 118	108	96																					
Respirations per minute	24	20 / 24	18	20	18 / 20	20 / 78		18 / 20	16	20																					
Motions																															

Temperature, Fahrenheit: 97° – 107°



CLINICAL CHART.

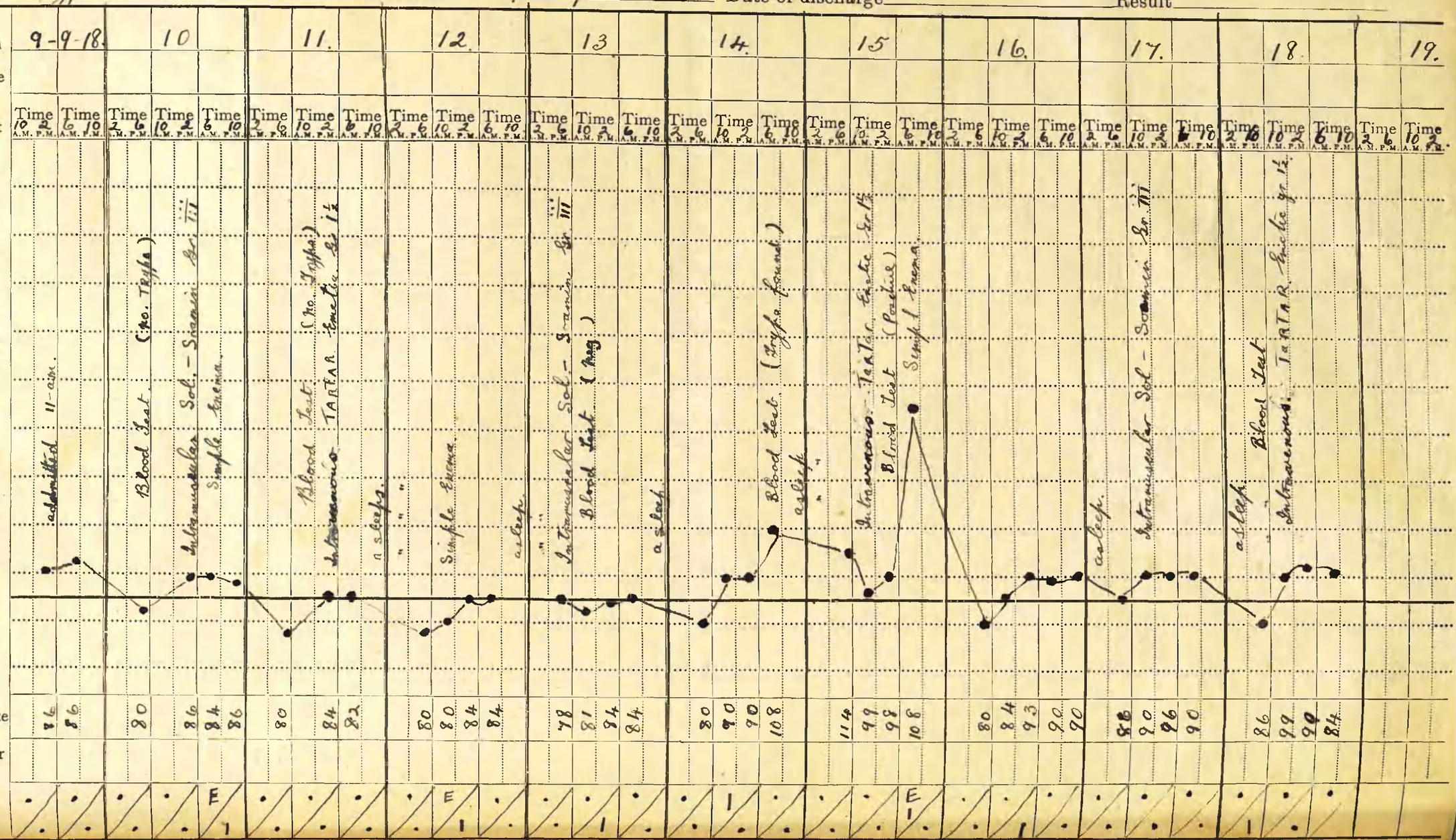
(To be attached to Case Sheet.)

Army Form B. 181.

Corps R. E. Tels. H.M. ~~Military~~ Hospital Ship Dongola

No. 548902 Rank and Name Spr. Monk. R. Age 20 Service 1 6/12

Disease Trypanosomiasis Date of admission 9-9-18. Date of discharge Result



Case A1.

CLINICAL CHART.

(To be attached to the case sheet.)

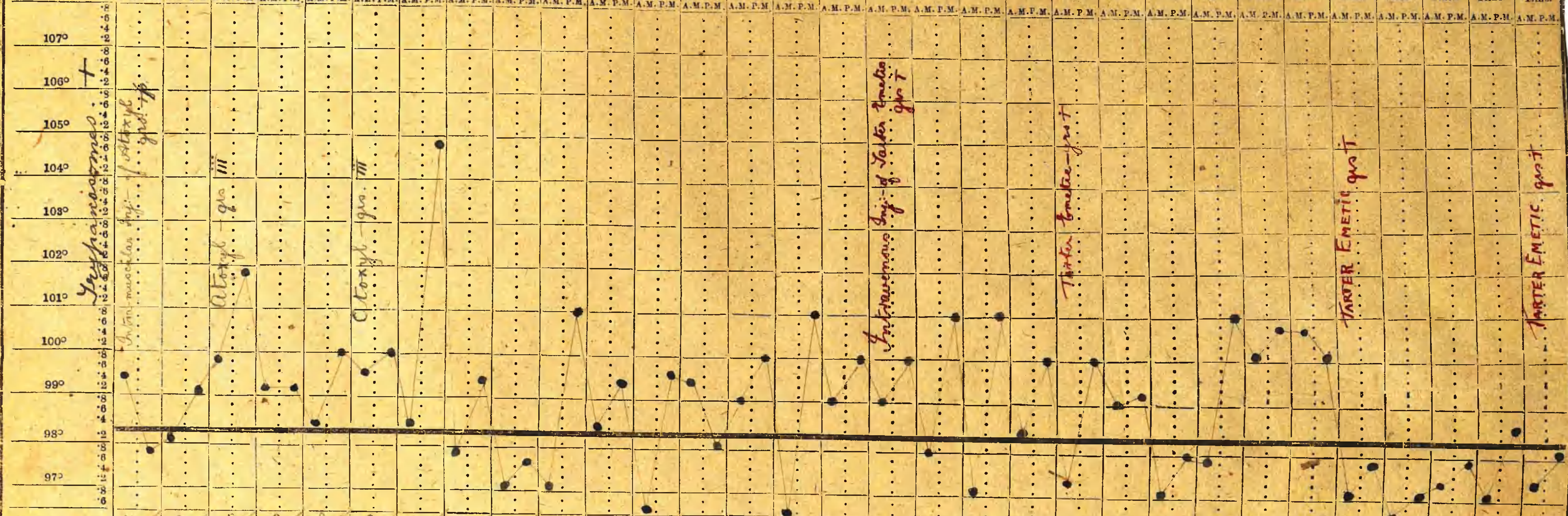
A. F. B181.
Gratis.
15-2-10.

Corps Carrier Corps **No.** N.S.A. 507037 **Rank and Name** Boki Tofeki **Age** 36 **Service** 2 years **Hospital Station** C.D.H. D.S.M.

Disease Trypanosomiasis **Date of Admission** 4/5/18 **Date of Discharge** ____ **Result** ____

May 1918

Dates of Observation	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1/6/18	2	3
Day of Disease																															
Temperature, Fahrenheit.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
Pulse per minute	114 / 102	102 / 110	100 / 120	120 / 100	120 / [illegible]	120 / 120	110 / 120	100	100	120	130	110	120	96	94	86															
Respirations per minute																															
Motions.																															



A 2.

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps Carrier Corps No. KA/507037. Rank and Name Baki Lofeki Age 36 Service 24/12 Hospital Station CDH DSM

Disease Trypanosomiasis Date of Admission 4/5/18 Date of Discharge Result

June 1918

Intravenous Inj:- of Tarter Emetic grs I

Tarter Emetic grs I.

Tarter Emetic grs I ss.

Tarter Emetic grs I ss.

Tarter Emetic grs I ss

Tarter Emetic grs I ss

Tarter Emetic grs I ss

A 3

CLINICAL CHART.

A. F. B181.
Gratis.
15-2-10.

(To be attached to the case sheet.)

Corps. Carrier Corps

No. N 1A 504037 Rank and Name Daki Sofeki Age 36 Service 2 4/12 Hospital Station Lab Dept Dslm

Disease Trypanosomiasis Date of Admission 4/5/18 Date of Discharge Result

July

Dates of Observation.	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1/8/18	2	3
Day of Disease.																															
Temperature, Fahrenheit.	Time. A.M. P.M.																														
107°																															
106°																															
105°																															
104°																															
103°																															
102°																															
101°																															
100°																															
99°																															
98°																															
97°																															
Pulse per minute																															
Respirations per minute																															
Motions.																															

Intravenous Inj. of Tartar Emetic gro V.

Back. Reports. Spirochaetes of Relapsing Fever ++

Intramuscular Inj. of N/10 Atoxyl gro III

Atoxyl gro III

Back. Reports. Spirochaetes of Relapsing Fever ++

Tartar Emetic gro 1/60

Atoxyl gro III

Atoxyl gro III

Tartar Emetic gro 1/60

Tartar Emetic gro 1/60

Back. Reports. Spirochaetes of Relapsing Fever ++

Atoxyl gro III

A4

CLINICAL CHART.

A. F. P181.
Gratis.
15-2-10.

(To be attached to the case sheet.)

Corps Carrier Corps *No.* MSA 504034 *Rank and Name* Baki Soleki *Age* 36 *Service* 2 4/12 *Hospital Station* [illegible]

Disease Trypanosomiasis *Date of Admission* 4/3/18 *Date of Discharge* *Result*

August.

Dates of Observation.	4/8/18	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1/9/18	2	3
Day of Disease.																															
Temperature, Fahrenheit. Time. A.M. P.M.			Intramuscular inj. of Atoxyl grs. iii.	Back. Reports: Stinchart of Relapsing Fever	Intramuscular inj. of Tartar Emetic grs. ¹/₁₅₀			Atoxyl grs. iii.	Tartar Emetic grs. ¹/₁₅₀			Atoxyl grs. iii.	Tartar Emetic grs. ¹/₁₅₀	Back. Reports: Spirochaete of Relapsing Fever		Atoxyl grs. iii.	Tartar Emetic grs. ¹/₁₅₀		Atoxyl grs. iii.		Tartar Emetic grs. ¹/₁₅₀	Atoxyl grs. iii.		Tartar Emetic grs. ¹/₁₅₀		Atoxyl grs. iii.		Tartar Emetic grs. ¹/₁₅₀		Atoxyl grs. iii.
107°																															
106°																															
105°																															
104°																															
103°																															
102°																															
101°																															
100°																															
99°																															
98°																															
97°																															
Pulse per minute																															
Respirations per minute																															
Motions.																															

A 5

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps Carrier Corps **No.** 11 SA 507037 **Rank and Name** Baki Sofeki **Age** 36 **Service** 24/12 **Hospital Station** CDH DSM

September **Disease** Trypanosomiasis **Date of Admission** 4/5/18 **Date of Discharge** **Result**

Intramuscular Inj. of Tartar Emetic grs. IISS

Intramuscular Inj. of Atoxyl grs. III

Tartar Emetic grs IISS

Atoxyl grs III

Tartar Emetic grs IISS

Atoxyl grs III

Tartar Emetic grs IISS

Bact. Report: Spirochaete of Relapsing Fever + +

Tartar Emetic grs IISS

Atoxyl grs III

Tartar Emetic grs IISS

Atoxyl gr. III

Tartar Emetic grs IISS

Atoxyl grs III

A 6

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

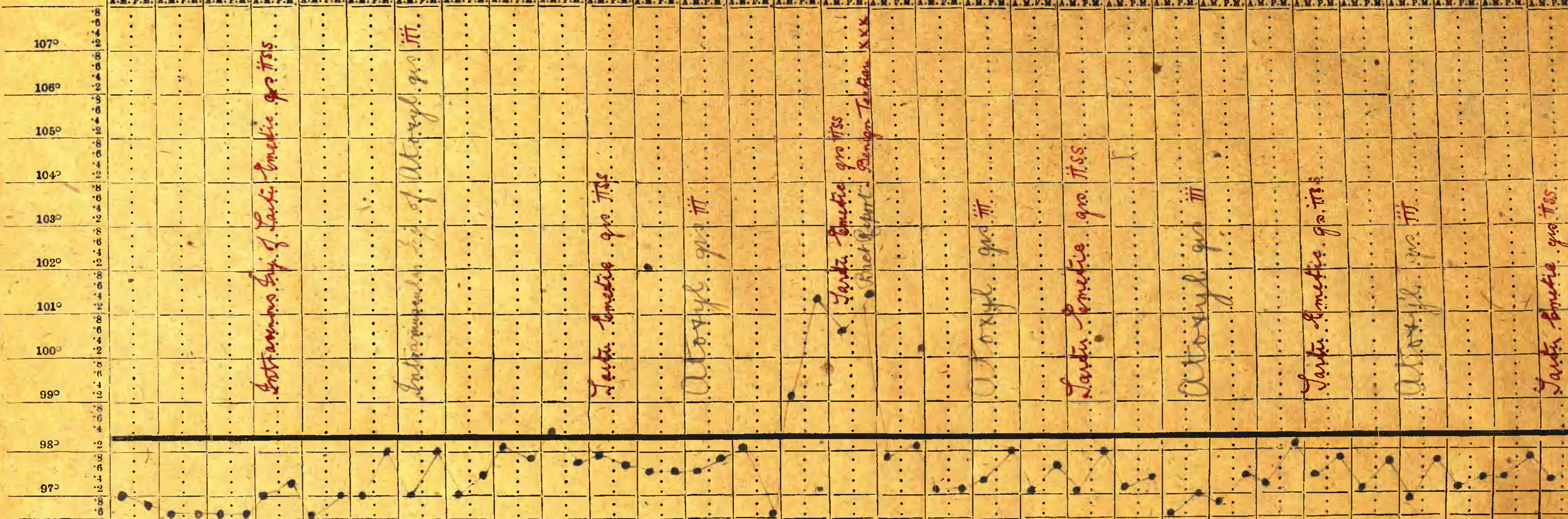
Corps Carrier Corps **No.** MSA 507837 **Rank and Name** Baku Lofeki **Age** 30 **Service** 24/12 **Hospital Station** CDH DSnj

~~Disease~~ **Disease** Trypanosomiasis **Date of Admission** 4/5/18 **Date of Discharge** **Result**

Dates of Observation: 5/10/18, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 1/11/18, 2, 3, 4

Day of Disease.

Temperature, Fahrenheit. — Time. A.M. P.M.



PULSE PER MINUTE

RESPIRATIONS PER MINUTE

Motions.

a 7

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps Carrier Corps No. M2a 507037 Rank and Name Baku Ifeki Age 36 Service 24/12 Hospital Station 62nd Div

Disease Trypanosomiasis Date of Admission 4/6/18 Date of Discharge Result

November

Dates of Observation.	5/11/18	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Day of Disease.																
Temperature, Fahrenheit. Time. A.M. P.M.																
107°																
106°																
105°																
104°																
103°																
102°																
101°																
100°																
99°																
98°																
97°																
Pulse per minute																
Respirations per minute																
Motions.																

Intramuscular Inj.- Tartar Emetic gr iii

Intravenous Inj.- Tartar Emetic gr iii

Tartar Emetic gr iii

Atoxyl gr x

Intramuscular Inj.- Atoxyl gr x

T R Y P A N O S O M I A S I S

****

CHART OF CASE B. (NATIVE)

B1

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps Carrier No. Porter S.T.G. 97138 Rank and Name Saidi Makambo Age Service Hospital Station CDH Dsm

Disease Trypanosomiasis Date of Admission 17/6/18 Date of Discharge Result

June

Bact Report: Trypo +

Intravenous Inj of Tarter Emetic grs i

Tarter Emetic grs iss

Tarter Emetic grs iss

Tarter Emetic grs iss

Intramuscular Inj of Atoxyl grs ii

Tarter Emetic grs ii

Atoxyl grs iii

Atoxyl grs iii

B 2

July 1918

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps Carriers

No. Porter 1/Tg 971138 ***Rank and Name*** Saidi Makambi ***Age*** ***Service*** ***Hospital Station***

Disease Trypanosomiasis ***Date of Admission*** 17/6/18 ***Date of Discharge*** ***Result***

Dates of Observation.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1/8/18	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Day of Disease.																															
Temperature, Fahrenheit.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
		Intravenous Inj: of Tartar Emetic grs ii ss.		Intramuscular Inj: of Atoxyl grs iii		Tartar Emetic grs ii ss			Atoxyl grs iii		Tartar Emetic grs ii ss.		Atoxyl grs iii		Tartar Emetic grs ii			Atoxyl grs iii		Tartar Emetic grs ii ss.			Atoxyl grs iii			Tartar Emetic grs ii ss.					

In charge of case

B 3

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps Carrier **No.** Porter 1/Ty 97038 **Rank and Name** Saidi Makambi **Age** ______ **Service** ______ **Hospital Station** ______

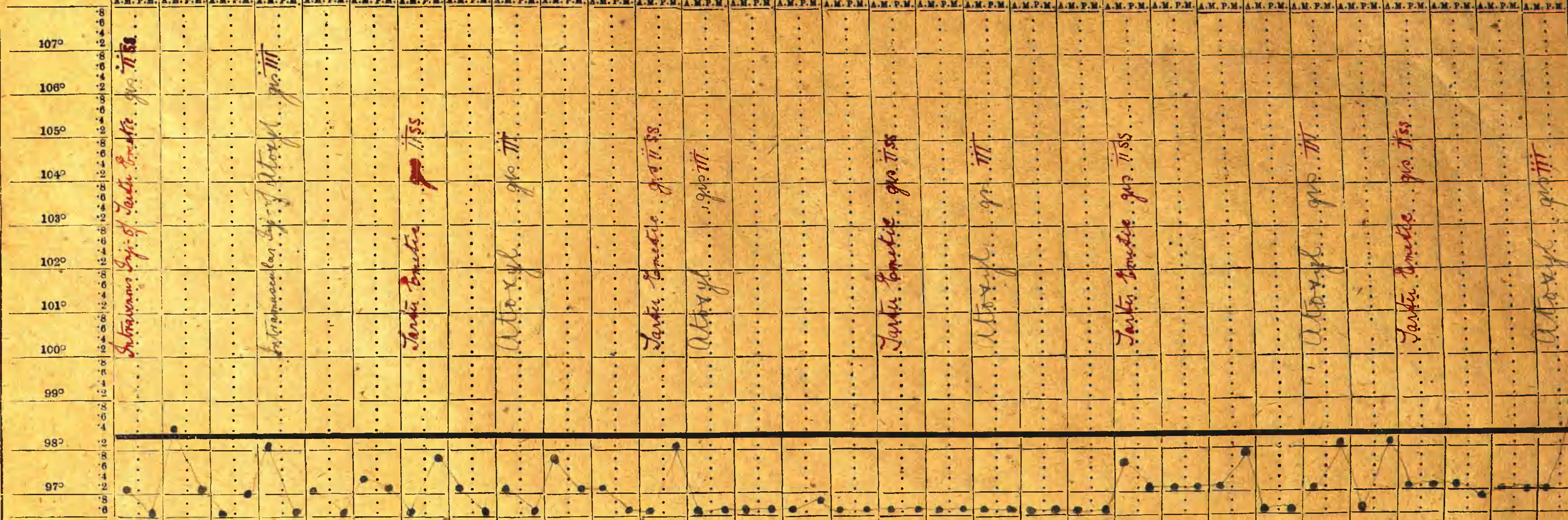
Disease Trypanosomiasis **Date of Admission** 17/6/18 **Date of Discharge** ______ **Result** ______

August

Dates of Observation	Treatment
16	Intravenous Inj. of Tarter Emetic grs II ss
17	
18	
19	Intramuscular Inj. of Atoxyl grs III
20	
21	
22	Tarter Emetic grs II ss
23	
24	Atoxyl grs III
25	
26	
27	Tarter Emetic grs II ss
28	Atoxyl grs III
29	
30	
31	
1/9/18	Tarter Emetic grs II ss
2	
3	Atoxyl grs III
4	
5	
6	Tarter Emetic grs II ss
7	
8	
9	
10	Atoxyl grs III
11	
12	Tarter Emetic grs II ss
13	
14	
15	Atoxyl grs III

Day of Disease.

Temperature, Fahrenheit. Time. A.M. P.M.



PULSE PER MINUTE

RESPIRATIONS PER MINUTE

Motions.

In charge of case

13 4

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B101.
Gratis.
15-2-10.

Corps Carrier *No.* 17/g 97138 Porter *Rank and Name* Saidi Makambo *Age* ______ *Service* ______ *Hospital Station* ______

Disease Trypanosomiasis *Date of Admission* 17/6/18 *Date of Discharge* ______ *Result* ______

September

Dates of Observation	Temperature, Fahrenheit (entries)	Motions
16	Intravenous Inj. of Tartar Emetic grs. ii ss	1 / 1
17		1 / 1
18		1 / 1
19	Intramuscular Inj. of Atoxyl grs. ii	1 / 1
20	Tartar Emetic grs. ii ss	1 / 1
21		1 / 1
22	Atoxyl grs. ii	1 / 1
23		1 / 1
24	Tartar Emetic grs. ii ss	1 / 1
25		1 / 1
26	Atoxyl grs. iii	1 / 1
27		1 / 0
28	Tartar Emetic grs. ii ss	1 / 1
29		1 / 1
30	Atoxyl grs. iii	1 / 1
1/10/18	Tartar Emetic grs. ii ss	1 / 1
2		1 / 1
3	Atoxyl grs. iii	1 / 1
4	Tartar Emetic grs. ii ss	1 / 0
5	Atoxyl grs. iii	1 / 1
6	on the 6/10/18	1 / 1
7	Tartar Emetic grs. ii ss	1 / 1
8		1 / 1
9	Atoxyl grs. iii	1 / 1
10		0 / 1
11	Tartar Emetic grs. ii ss	1 / 1
12		1 / 1
13		1 / 1
14		1 / 0
15	Tartar Emetic grs. ii ss	1 / 0
16		1 / 1

Day of Disease. Time. A.M. P.M. Pulse per minute. Respirations per minute.

B 4

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps Carrier No. 17y 97138 Porter Rank and Name Saidi Makambi Age ______ Service ______ Hospital Station ______

September

Disease Trypanosomiasis Date of Admission 17/6/18 Date of Discharge ______ Result ______

Dates of Observation	Treatment noted	Motions
16	Intravenous Inj. of Tartar Emetic grs. ii ss	1 / 1
17		1 / 1
18		1 / 1
19	Intramuscular Inj. of Atoxyl grs. ii	1 / 1
20	Tartar Emetic grs. ii ss	1 / 1
21	0	1 / 1
22	Atoxyl grs. ii	1 / 1
23		1 / 1
24	Tartar Emetic grs. ii ss	1 / 1
25		1 / 1
26	Atoxyl grs. iii	1 / 1
27		1 / 0
28	Tartar Emetic grs. ii ss	1 / 1
29		1 / 1
30	Atoxyl grs. iii	1 / 1
1/10/18	Tartar Emetic grs. ii ss	1 / 1
2		1 / 1
3	Atoxyl grs. iii	1 / 1
4	Tartar Emetic grs. ii ss	1 / 0
5	Atoxyl grs. iii — on the 6/10/18	1 / 1
6		1 / 1
7	Tartar Emetic grs. ii ss	1 / 1
8		1 / 1
9	Atoxyl grs. iii	1 / 1
10		0 / 1
11	Tartar Emetic grs. ii ss	1 / 1
12		1 / 1
13		1 / 1
14		1 / 0
15	Tartar Emetic grs. ii ss	1 / 0
16		1 / 1

Day of Disease. Temperature, Fahrenheit. Time. A.M. P.M. 107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°

Pulse per minute

Respirations per minute

B 5

A. F. B181.
Gratis.
15-2-10.

CLINICAL CHART.

(To be attached to the case sheet.)

Corps Carrier *No.* Porter 17/Lg/1138 *Rank and Name* Saidi Makambi *Age* ______ *Service* ______ *Hospital Station* ______

Disease Trypanosomiasis ______ *Date of Admission* 17/6/18 *Date of Discharge* ______ *Result* ______

October

Dates of Observation	Temperature chart annotations	Motions
17	Intramuscular Inj. of Atoxyl grs III	1 1
18		1 1
19		1 1
20	Intravenous Inj. of Tarter Emetic grs II ss; Tryps. was seen in field	1 1
21		0 0
22		1 0
23	Atoxyl grs III	1 0
24		0 1
25	Tarter Emetic grs II ss	0 1
26		0 1
27	Atoxyl grs III	1 0
28		1 1
29		1 0
30	Tarter Emetic grs III	1 0
31	Atoxyl grs III	1 0
1/11/18		1 0
2		1 0
3	Tarter Emetic grs III	1 0
4		1 0
5		1 0
6	Atoxyl grs III	1 0
7		1 0
8		1 0
9		1 0
10	Tarter Emetic grs III	1
11		
12		
13		
14		
15		
16		

Day of Disease.
Temperature, Fahrenheit. Time. A.M. P.M.
Pulse per minute
Respirations per minute
Motions.

T R Y P A N O S O M I A S I S.

****

CHART OF CASE C. (NATIVE).

C 1.

CLINICAL CHART.

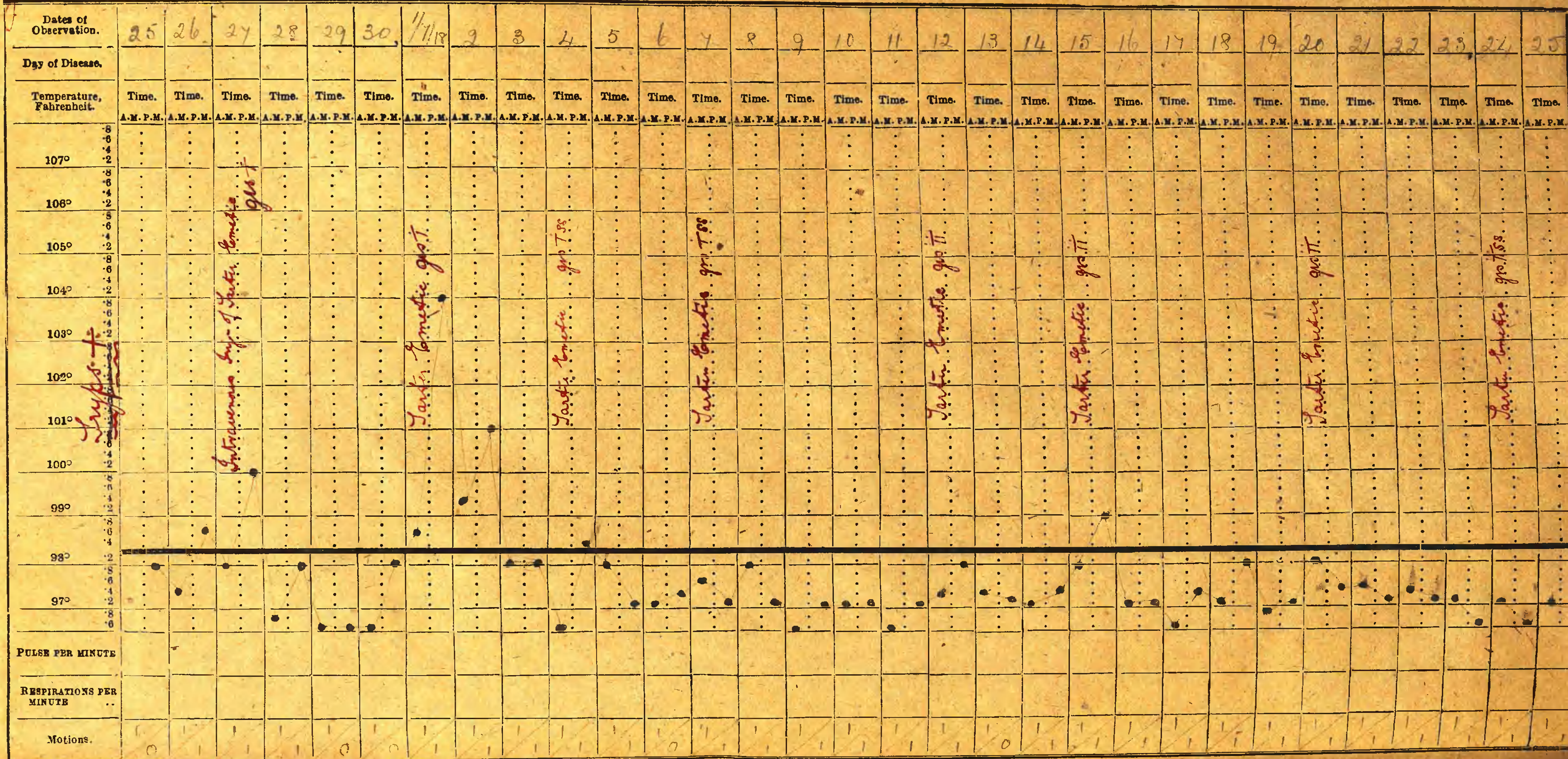
A. F. B181.
Gratis.
15-2-10.

(To be attached to the case sheet.)

Corps German No. Porter Rank and Name Myinge Bikailu Age ____ Service Lyons Hospital Station C D H. DSm

Disease Trypanosomiasis Date of Admission 25/6/18 Date of Discharge ____ Result ____

June



C 2

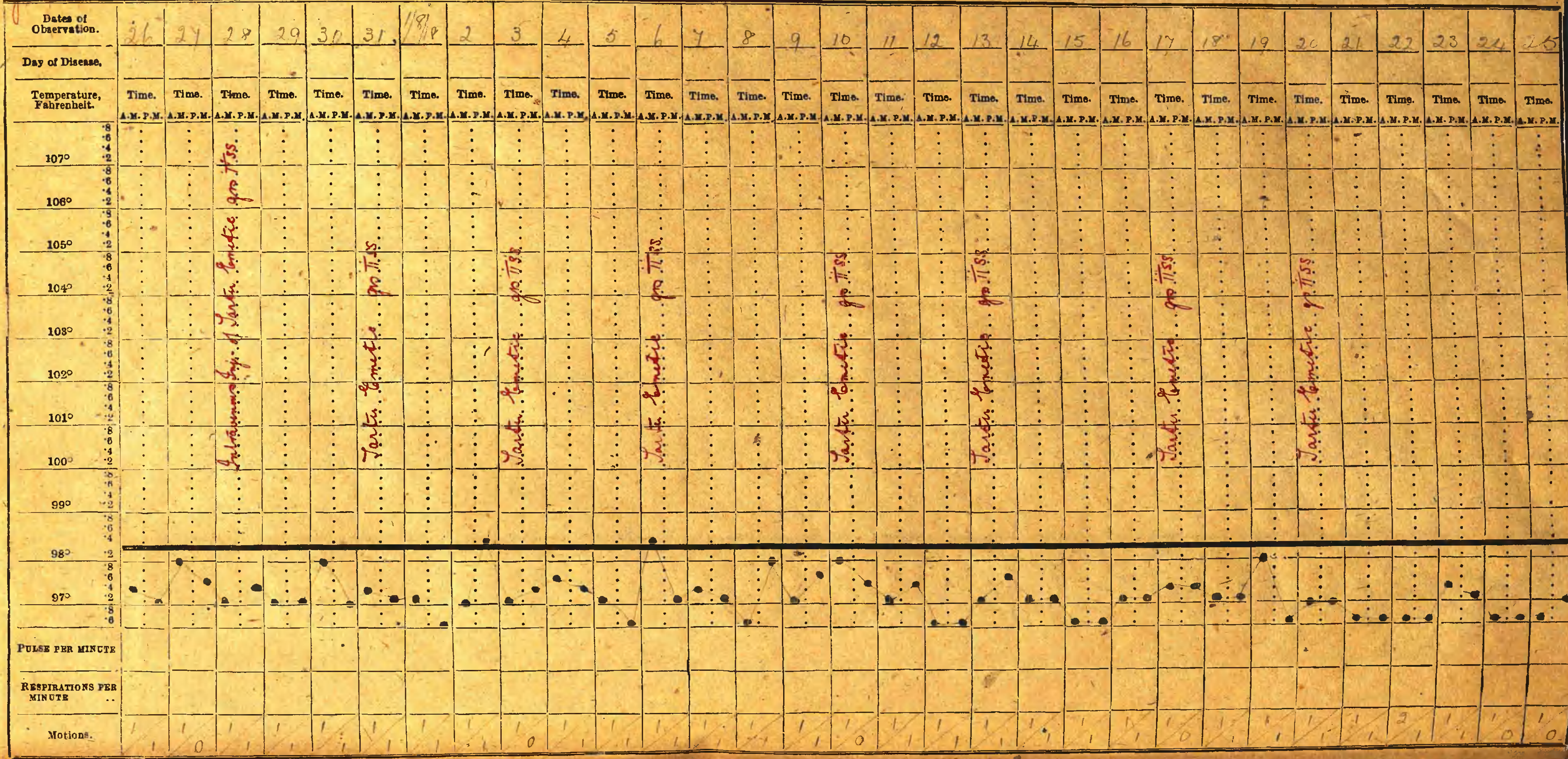
CLINICAL CHART.

A. F. B181.
Gratis.
15-2-10.

(To be attached to the case sheet.)

Corps German **No.** Porter **Rank and Name** Mymge Bikalu **Age** ____ **Service** 4 years **Hospital Station** C.D.H. D.S.M.

July **Disease** Trypanosomiasis **Date of Admission** 25/6/18 **Date of Discharge** ____ **Result** ____



C 3

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

August ~~October~~

Corps. German No. Porter Rank and Name Nyunge Bikalu Age ____ Service 2 yrs Hospital Station C.D.H. DSM

Disease Trypanosomiasis Date of Admission 25/6/18 Date of Discharge ____ Result ____

Dates of Observation	26	27	28	29	30	31	1/9/18	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Day of Disease																															
Temperature, Fahrenheit. (Time. A.M. P.M.)	Intravenous Inj. of Tartar Emetic grs. ii ss				Tartar Emetic grs. ii ss				Tartar Emetic grs. ii ss				Tartar Emetic grs. ii ss			Tartar Emetic grs. ii ss				Tartar Emetic grs. ii ss				Tartar Emetic grs. ii ss				Tartar Emetic grs. ii ss			
Pulse per minute																															
Respirations per minute																															
Motions.																															

Temperature scale: 107°, 106°, 105°, 104°, 103°, 102°, 101°, 100°, 99°, 98°, 97° (subdivisions ·2 ·4 ·6 ·8)

C 4

CLINICAL CHART.

A. F. B181.
Gratis.
15-2-10.

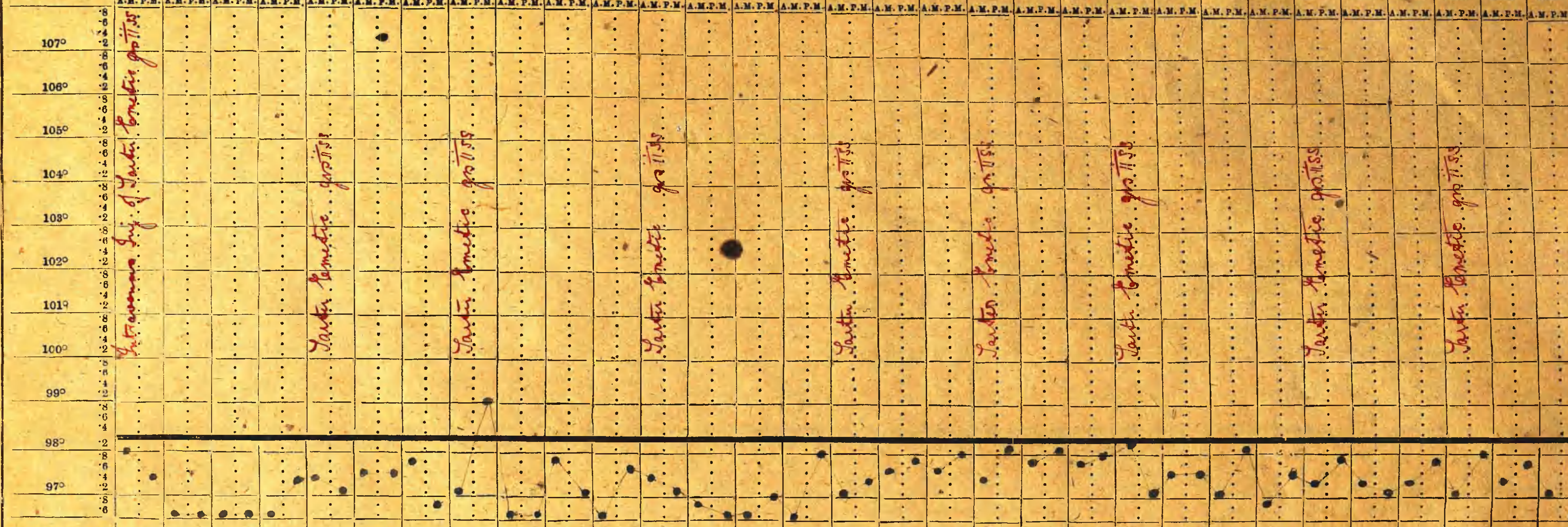
(To be attached to the case sheet.)

Corps German **No.** Porter **Rank and Name** Myunge Bikalu **Age** ____ **Service** 4 yrs **Hospital Station** C.D.H. D.S.M.

September **Disease** Trypanosomiasis **Date of Admission** 25/6/18 **Date of Discharge** ____ **Result** ____

Dates of Observation	Day of Disease	Treatment
26		Intravenous Inj. of Tartar Emetic grs II ss
27		
28		
29		
30		Tartar Emetic grs II ss
1/10/18		
2		
3		Tartar Emetic grs II ss
4		
5		
6		
7		Tartar Emetic grs II ss
8		
9		
10		
11		Tartar Emetic grs II ss
12		
13		
14		Tartar Emetic grs II ss
15		
16		
17		Tartar Emetic grs II ss
18		
19		
20		
21		Tartar Emetic grs II ss
22		
23		
24		Tartar Emetic grs II ss
25		
26		

Temperature, Fahrenheit. (Time. A.M. P.M.)



Pulse per minute

Respirations per minute

Motions.

In charge of case.

C 5

CLINICAL CHART.

A. F. B181.
Gratis.
15-2-10.

(To be attached to the case sheet.)

Corps German **No.** Porter **Rank and Name** Myunge Bikalu **Age** ______ **Service** 4 years **Hospital Station** C D H / D E M

Disease Trypanosomiasis **Date of Admission** 25/6/18 **Date of Discharge** ______ **Result** ______

October

Dates of Observation	27	28	29	30	31	1/11/18	2	3	4	5	6	7	8	9	10
Day of Disease															
Temperature, Fahrenheit.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
Notes				Intravenous Inj. of Tartar Emetic grs ii ss / Bact. Report Benign Tertian +++		Tartar Emetic grs ii ss		Tart. Emetic grs ii ss				Tartar Emetic grs ii ss			Tartar Emetic grs ii ss
Pulse per minute															
Respirations per minute															
Motions	1 / 0	0 / 0	1 / 1	1 / 1	1 / 0	1 / 0	1 / 0	1 / 0	1 / 0	1 / 0	1 / 0	1 / 0	1 / 0	1 / 0	

Temperature scale: 107°, 106°, 105°, 104°, 103°, 102°, 101°, 100°, 99°, 98°, 97°

Signature ______ In charge of case.

T R Y P A N O S O M I A S I S.

*****

CHART OF CASE D. (NATIVE).

D 1

CLINICAL CHART.

(To be attached to the case sheet.)

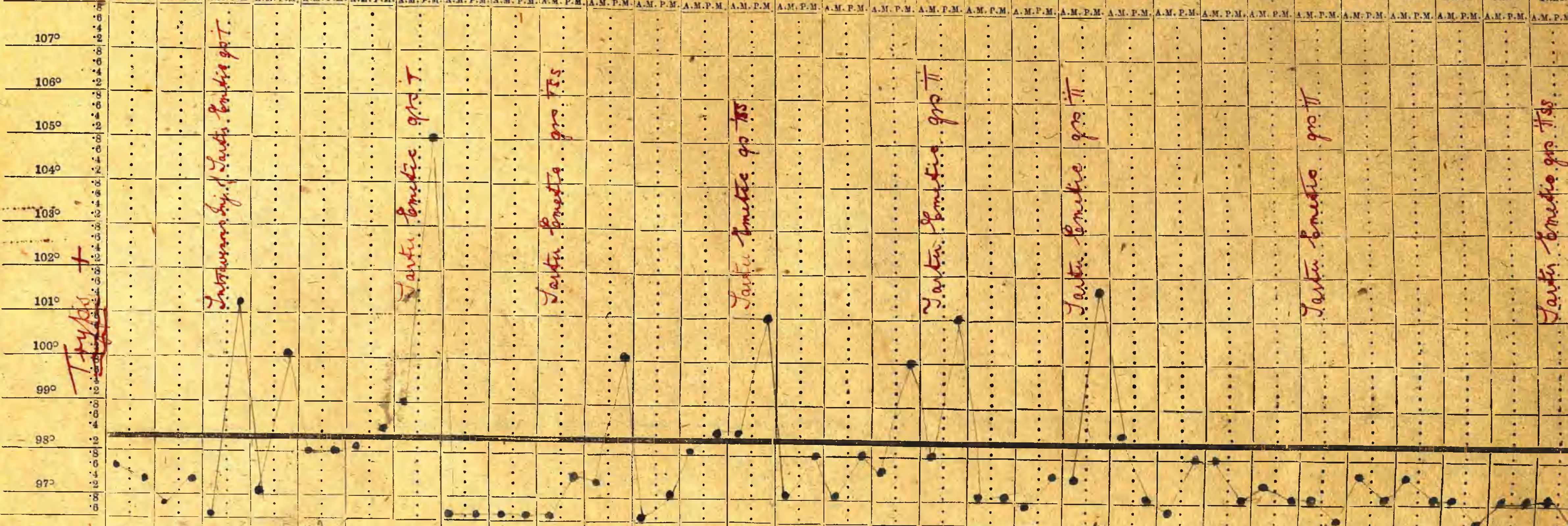
A. F. B181.
Gratis.
15-2-10.

Corps German **No.** 5072 **Rank and Name** Seleke Lomba **Age** ____ **Service** 4 yrs **Hospital Station** C.D.H. DSM

Disease Trypanosomiasis **Date of Admission** 25/6/18 **Date of Discharge** ____ **Result** ____

June

Dates of Observation.	25	26	27	28	29	30	1/7/18	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Day of Disease.																															
Temperature, Fahrenheit.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.



	25	26	27	28	29	30	1/7/18
Pulse per minute			122		112 120		
Respirations per minute							
Motions.	0				0	0	

D 2.

A. F. B181.
Gratis.
15-2-10.

CLINICAL CHART.

(To be attached to the case sheet.)

Corps German *No.* Porter *Rank and Name* Seleke Lomba *Age* ____ *Service* 4 years *Hospital Station* CDK DSMF

July

Disease Trypanosomiasis *Date of Admission* 25/6/18 *Date of Discharge* ____ *Result* ____

Dates of Observation.	26	27	28	29	30	31	1/8/18	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Day of Disease.																															
Temperature, Fahrenheit.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
Treatment (written on chart)			Intravenous Inj. of Tartar Emetic grs ii ss			Tartar Emetic grs ii ss			Tartar Emetic grs ii ss			Tartar Emetic grs ii ss				Tartar Emetic grs ii ss			Tartar Emetic grs ii ss				Tartar Emetic grs ii ss			Tartar Emetic grs ii ss					
Pulse per minute																															
Respirations per minute																															
Motions.	/ /	/ 0	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ 0	/ /	/ /	/ /	/ /	/ /	/ 0	/ /	/ /	/ /	/ /	/ /	/ /	/ 0	/ /	/ /	/ /	/ /	/ /	/ /	/ 0	/ /

Temperature scale: 107°, 106°, 105°, 104°, 103°, 102°, 101°, 100°, 99°, 98°, 97°

D 3.

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps. German *No.* Porter *Rank and Name* Seleke Lomba *Age* ____ *Service* 4 yrs *Hospital Station* C.D.H. Dst no

Disease Trypanosomiasis *Date of Admission* 25/6/18 *Date of Discharge* ____ *Result* ____

August

Dates of Observation.	26	27	28	29	30	31.	1/9/18	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Day of Disease.																															
Temperature, Fahrenheit.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
107°–97°	Intravenous Inj. of Tartar Emetic grs IIss				Tartar Emetic grs IIss				Tartar Emetic grs IIss				Tartar Emetic grs IIss			Tartar Emetic grs IIss				Tartar Emetic grs IIss				Tartar Emetic grs IIss					Tartar Emetic grs IIss		
Pulse per minute																															
Respirations per minute ..																															
Motions.																															

D 4

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps German **No.** Porter **Rank and Name** Seleke Lomba **Age** ____ **Service** 4 yrs **Hospital Station** E.D.M. D.E.M.

September

Disease Trypanosomiasis **Date of Admission** 25/6/18 **Date of Discharge** ____ **Result** ____

Dates of Observation	Temperature, Fahrenheit (Time. A.M. P.M.)
26	
27	Intravenous Inj. of Tartar Emetic grs ii ss
28	
29	
30	
1/10/18	Tartar Emetic grs ii ss
2	
3	
4	Tartar Emetic grs ii ss
5	
6	
7	
8	Tartar Emetic grs ii ss
9	
10	
11	
12	Tartar Emetic grs ii ss
13	
14	
15	Tartar Emetic grs ii ss
16	
17	
18	Tartar Emetic grs ii ss
19	
20	
21	
22	Tartar Emetic grs ii ss
23	
24	
25	Tartar Emetic grs ii ss
26	

Day of Disease.

Temperature, Fahrenheit: 107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97°

Pulse per minute

Respirations per minute

Motions.

D 5

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. P181.
Gratis.
15-2-10.

Corps German *No.* Porter *Rank and Name* Lekete Lomba *Age* _____ *Service* 4½ *Hospital Station* 2nd Div

Disease Trypanosomiasis *Date of Admission* 25/6/18 *Date of Discharge* _____ *Result* Died

Dates of Observation.	27	28	29	30	31	1/11/18	2	3	4	5	6	7	8	9	10	
Day of Disease.																
Temperature, Fahrenheit. Time. A.M. P.M.																

Intravenous Inj. of Tartar Emetic gr. 1/35.

Tartar Emetic gr. 1/35 Rect. Repeat Benign tertian +

Tartar Emetic gr. 1/35

Tartar Emetic gr. 1/35

DIED

Cause of Death: Pneumonia.

Pulse per minute	
Respirations per minute	
Motions.	1 1 1 1 0 0 1 1 1 1 1 1 1 1 0

T R Y P A N O S O M I A S I S.

CHART OF CASE E. (NATIVE).

E 1.

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps Porter **No.** D.R.P. 702810 **Rank and Name** Muyuna Nikhubi **Age** ______ **Service** 3 yrs **Hospital Station** ______

Disease Trypanosomiasis **Date of Admission** 14/7/18 **Date of Discharge** ______ **Result** ______

July. 1918

Dates of Observation	Temperature, Fahrenheit (Time. A.M. P.M.)
14	
15	
16	
17	Bact. Report. Tryps +
18	
19	
20	Intravenous Inj. of Tartar Emetic grs I
21	
22	Intramuscular Inj. of Atoxyl grs II
23	
24	Tartar Emetic grs II
25	
26	Atoxyl grs III
27	
28	Tartar Emetic grs II
29	
30	Atoxyl grs III
31	Tartar Emetic grs IIss
1/8/18	
2	Atoxyl grs III
3	Tartar Emetic grs IIss
4	
5	Atoxyl grs III
6	Tartar Emetic grs IIss
7	
8	Atoxyl grs III
9	
10	Tartar Emetic grs IIss
11	
12	Atoxyl grs III
13	

Temperature scale: 107°, 106°, 105°, 104°, 103°, 102°, 101°, 100°, 99°, 98°, 97°

Day of Disease.

Pulse per minute

Respirations per minute

Motions. [illegible]

E 2

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps Porter
No. DoR 102210 *Rank and Name* Myjuna Nikhubi *Age* ________ *Service* 3 yrs *Hospital Station* 6 DH Dsm
Disease Trypanosomiasis *Date of Admission* 14/7/18 *Date of Discharge* ________ *Result* ________

August.

Dates of Observation.	Day of Disease.	Temperature, Fahrenheit.	Pulse per minute	Respirations per minute	Motions.
14					1/1
15					1/1
16		Intravenous Inj: of Tarter Emetic grs IIss			1/1
17					1/1
18					1/1
19		Intramuscular Inj: of Atoxyl grs III			1/1
20					1/1
21					1/1
22		Tarter Emetic grs IIss			1/1
23					1/1
24		Atoxyl grs III			1/1
25					1/1
26					1/1
27		Tarter Emetic grs IIss			1/1
28					1/1
29		Atoxyl grs III			1/1
30					1/1
31					1/1
1/9/18		Tarter Emetic grs IIss			1/1
2					1/1
3					1/1
4		Atoxyl grs III			1/1
5					1/1
6					1/1
7		Tarter Emetic grs IIss			1/1
8					1/1
9					1/1
10					1/1
11					1/1
12		Atoxyl grs III			1/0
13					1/0

63

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps Porter **No.** XRR 102210 **Rank and Name** Mungwina Nikhubi **Age** ______ **Service** 3 yrs **Hospital Station** CDH DSy

Disease Trypanosomiasis **Date of Admission** 14/7/18 **Date of Discharge** ______ **Result** ______

September

64

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps Porter *No.* DAF 102311 *Rank and Name* Munyuma Nikhubi *Age* ____ *Service* 3 yrs *Hospital Station* EDH DI nj

Disease Trypanosomiasis *Date of Admission* 14/7/18 *Date of Discharge* ____ *Result* ____

October.

Dates of Observation.	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1/11/18	2	3	4	5	6	7	8	9	10	11	12	13	14
Day of Disease.																															
Temperature, Fahrenheit.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
Pulse per minute																															
Respirations per minute																															
Motions.																															

Temperature scale: 107°, 106°, 105°, 104°, 103°, 102°, 101°, 100°, 99°, 98°, 97°

Annotations on chart:

- 15: Intravenous Inj. of Tartar Emetic grs IIss
- 16–17: Intramuscular Inj. of Atoxyl grs III
- 20: Tartar Emetic grs IIss
- 23: Atoxyl grs III
- 25: Tartar Emetic grs IIss
- 26: Bact. Report:- Tryps. +; do do :- Benign Tertian +++
- 27: Atoxyl grs III
- 30: Tartar Emetic grs III
- 1/11/18: Atoxyl grs III
- 3: Tartar Emetic grs III
- 7: Atoxyl grs III
- 10: Tartar Emetic grs IIss
- 12: Atoxyl grs III

T R Y P A N O S O M I A S I S.

*****

CHART OF CASE F. (NATIVE).

A. F. B181.
Gratis.
15-2-10.

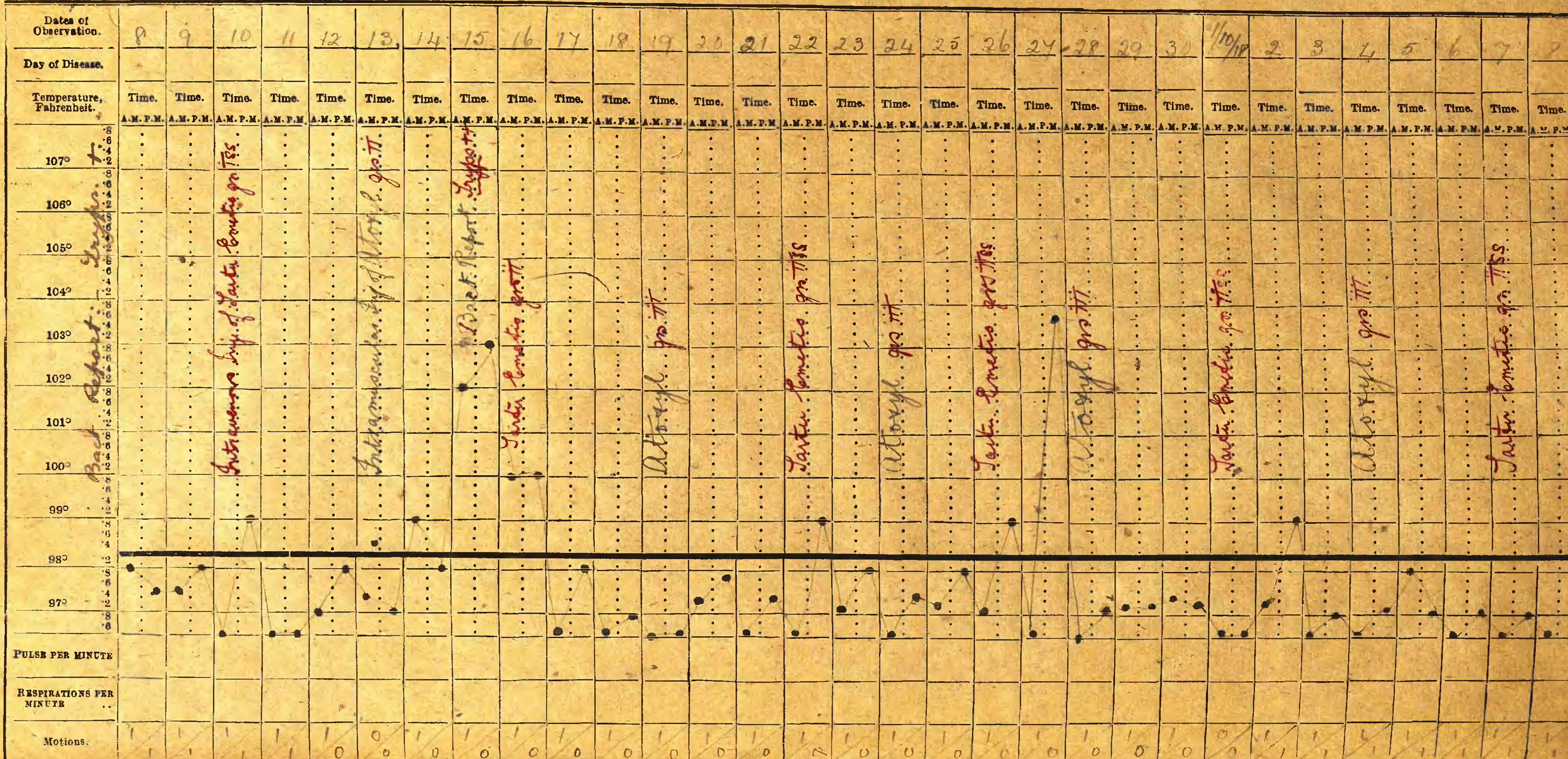
CLINICAL CHART.

(To be attached to the case sheet.)

Corps Carrier **No.** Lin 409531 **Rank and Name** Hicka Guwalo **Age** ____ **Service** ____ **Hospital Station** CDH DSm

Disease Trypanosomiasis **Date of Admission** 8/9/18 **Date of Discharge** ____ **Result** ____

September 1918.



7/2

A. F. I 1161.
Gratis.
15-2-10.

CLINICAL CHART.

(To be attached to the case sheet.)

Corps Carrier No. Lin 409532 Rank and Name Hicka Guvalo Age ____ Service ____ Hospital Station C.P.H. D.L.M.

Disease Trypanosomiasis Date of Admission 8/9/18 Date of Discharge ____ Result ____

October.

Dates of Observation.	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1/11/18	2	3	4	5	6	7	8
Day of Disease.																															
Temperature, Fahrenheit.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
Notes			Intramuscular Inj. of Atoxyl grs. III		Bact Report Tryps +		Tartar Emetic grs. IIss		Atoxyl grs. III			Tartar Emetic grs. IIss			Atoxyl grs. III		Tartar Emetic grs. IIss		Atoxyl grs. III			Tartar Emetic grs. IIss	Atoxyl grs. III			Tartar Emetic grs. IIss			Atoxyl grs. III		
Pulse per minute																															
Respirations per minute																															
Motions.	1/1	1/1	1/1	1/0	1/0	0/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0	1/1	1/0	1/0	1/0	0/0	1/0	1/0	1/0	1/0	1/0	1/0	1/0

CLINICAL CHART.

A. F. B181.
Gratis.
15-2-10.

(To be attached to the case sheet.)

Corps Carrier

No. Lin 409532 *Rank and Name* Hicks Guvalo *Age* _____ *Service* _____ *Hospital Station* Lindi DSM.

Disease Trypanosomiasis *Date of Admission* 7/9/10 *Date of Discharge* _____ *Result* _____

November.

Dates of Observation.	9	10	11	12	13	14	15	16	17	18	19	20
Day of Disease.												
Temperature, Fahrenheit. Time. A.M. P.M.												
107°												
106°												
105°												
104°												
103°												
102°												
101°												
100°												
99°												
98°												
97°												
Pulse per minute												
Respirations per minute												
Motions.		1 0	1 0	0 0	1 0	1 0	1 0	1				

Intravenous Inj. of Tartr. Emetic. gr. 1/30

Intramuscular Inj. of Tartr. Emetic gr. 1/30

Tartr. Emetic gr. 1/30

T R Y P A N O S O M I A S I S.

****

CHART OF CASE G. (NATIVE).

CLINICAL CHART.

A. F. P151.
Gratis.
15-2-10.

(To be attached to the case sheet.)

Corps Hospl Boy **No.** Lin 422059 Porter **Rank and Name** Abdulla Hamin **Age** _____ **Service** _____ **Hospital Station** 62 Dn

Disease Trypanosomiasis **Date of Admission** 8/9/18 **Date of Discharge** _____ **Result** _____

September 1918

Dates of Observation.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1/10/18	2	3	4	5	6	7	8
Day of Disease.																															
Temperature, Fahrenheit. Time. A.M. P.M.																															
107°																															
106°																															
105°																															
104°																															
103°																															
102°																															
101°																															
100°																															
99°																															
98°																															
97°																															
Pulse per minute																															
Respirations per minute																															
Motions.																															

Back Report. Typho ++

Intravenous Inj. of Tartar Emetic gr i

Intramuscular Inj. of Atoxyl gr ii.

Tartar Emetic gr ii

Atoxyl gr iii

Tartar Emetic gr iiss

Atoxyl gr iii

Tartar Emetic gr iiss

Atoxyl gr iii

Tartar Emetic gr iiss

Atoxyl gr iii

Tartar Emetic gr iiss

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181
Gratis.
15-2-10.

Corps Hospl Boy No. Lin 422059 Rank and Name Abdulla Hamin Age ____ Service ____ Hospital Station CMH Dera

Disease Leptospiro mia ics Date of Admission 8/9/18 Date of Discharge ____ Result ____

October 1918.

Dates of Observation.	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1/11/18	2	3	4	5	6	7	8
Day of Disease.																															
Temperature, Fahrenheit. Time. A.M. P.M.				Intramuscular Inj. of Neoarsphenamine gr. iii			Intravenous Inj. of Neoarsphenamine gr. iii 5.8		Neoarsphenamine gr. iii			Tartar Emetic gr. 1/15.8			Neoarsphenamine gr. iii		Tartar Emetic gr. 1/15.8			Neoarsphenamine gr. iii	Tartar Emetic gr. 1/15.8			Neoarsphenamine gr. iii		Tartar Emetic gr. 1/15.8			Neoarsphenamine gr. iii		
107°																															
106°																															
105°																															
104°																															
103°																															
102°																															
101°																															
100°																															
99°																															
98°																															
97°																															
Pulse per minute																															
Respirations per minute																															
Motions.																															

G 3

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps Hospl Boy *No.* I.A. 422059 *Rank and Name* Abdulla Hamin *Age* ______ *Service* ______ ***Hospital Station*** CDH DSM

Disease Trypanosomiasis *Date of Admission* 8/9/18 *Date of Discharge* ______ *Result* ______

November. 1918.

Dates of Observation.	9	10	11	12
Day of Disease.				

Intravenous Inj. of Tartar Emetic grs 1/32

DIED — Cause Pneumonia.

T R Y P A N O S O M I A S I S.

*****

CHART OF CASE M. (NATIVE).

H.1.

CLINICAL CHART.

A. F. B181. *Gratis.* 15-2-10.

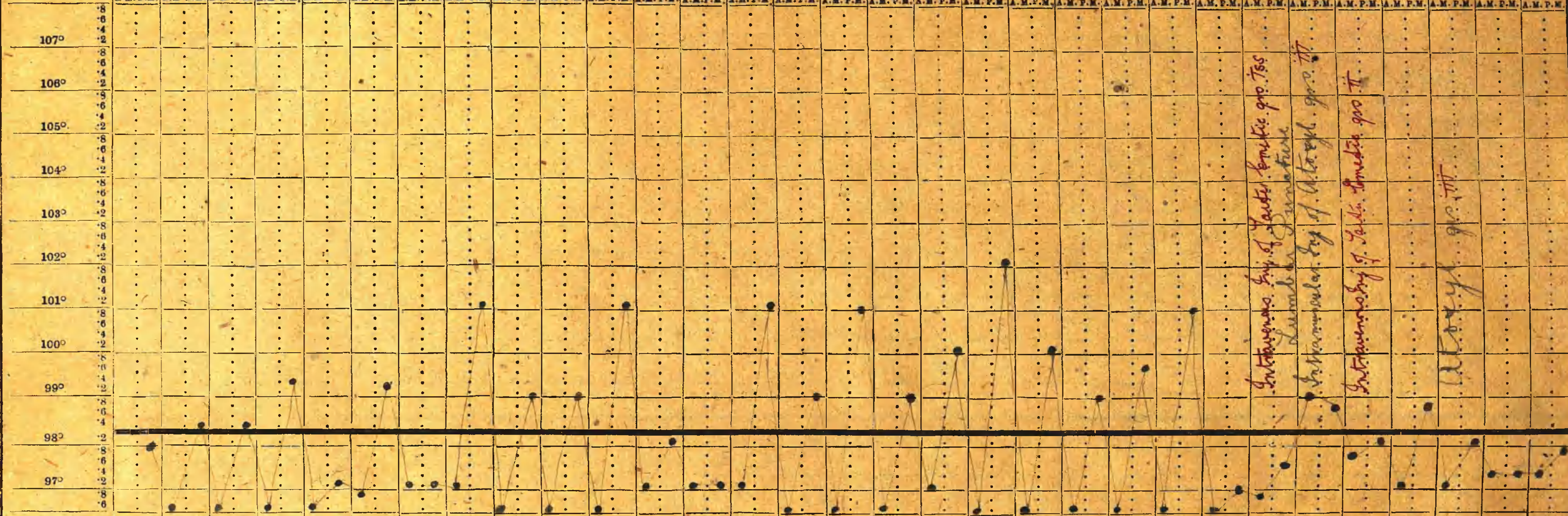
(To be attached to the case sheet.)

Corps Carrier **No.** German Porter **Rank and Name** Mihayo Mkouka **Age** ______ **Service** 3 yrs **Hospital Station** EDH DOM

Disease Trypanosomiasis **Date of Admission** 19/9/18 **Date of Discharge** ______ **Result** ______

September

Dates of Observation.	19/9/18	20	21	22	23	24	25	26	27	28	29	30	1/10/18	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Day of Disease.																															
Temperature, Fahrenheit.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.	Time. A.M. P.M.
Pulse per minute																															
Respirations per minute ..																															
Motions.																								2/0	2/0	1/0	1/0	1/0	1/0	1/0	1/0



K 2

A. F. B181.
Gratis.
15-2-10.

CLINICAL CHART.

(To be attached to the case sheet.)

Corps Carrier **No.** German Porter **Rank and Name** Mihayo Mkonka **Age** **Service** 3 yrs **Hospital Station** C.D.H. DSM

October 1918 **Disease** Trypanosomiasis **Date of Admission** 19/9/18 **Date of Discharge** **Result**

T R Y P A N O S O M I A S I S.

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CHART OF CASE I. (NATIVE).

L 1

CLINICAL CHART.

(To be attached to the case sheet.)

A. F. B181.
Gratis.
15-2-10.

Corps Porter No. NCC 637 Rank and Name Lebrin Age ____ Service ____ Hospital Station CDH

Disease Trypanosomiasis Date of Admission 25/10/18 Date of Discharge ____ Result ____ DDM

October 1918