

TABLE 3.
T. congolense. *Artificial Transmission.*

No.	Animal.	Source of Blood	Date Sub-inoculated.	Tryps. First Appeared.	Initial Symptoms.	Dead.	Further Remarks.
1	*Ox 867	Bull Cm. 1, natural case	30/11/21	8/12/21	9/12/21, temp. rose to 104·8°; 17/12/21, salivation.	23/ 2/22	Infected 1 c.c. citrated blood subcutaneously.
2	Pig 2	Bull Cm. 1, natural case	28/11/22	—	—	—	Infected 1 c.c. citrated blood subcutaneously.
3	Rabbit 8	Bull Cm. 1, natural case	30/11/21	—	8/12/21, temp. rose to 103·4°; beginning January, 1922, losing condition	15/ 1/22	Infected 1 c.c. citrated blood subcutaneously.
4	Guinea-pig 4	Bull Cm. 1. natural case	30/11/21	—	—	9/12/21	Infected 1 c.c. citrated blood subcutaneously.
5	* Ox 863	Cow M. 1, natural case	17/12/21	28/12/21	29/12/21, temp. rose to 105·2°; 28/12/21, eyeballs sunken and nasal discharge	14/ 7/22	Infected 1 c.c. fresh blood subcutaneously.
6	Ox 872	Ox 863, artificial case	28/ 1/22	6/ 2/22	10/2/22, temp. rose to 103·8°; 15/2/22, salivation	19/ 5/22	Infected 5 c.c. citrated blood subcutaneously.
7	Ox 861	Ox 863, artificial case	28/ 1/22	6/ 2/22	30/1/22, temp. rose to 106°; 21/3/22, photophobia and lachrymation	19/ 4/22	Infected 5 c.c. citrated blood subcutaneously.
8	Ox 868	Ox 863, artificial case	28/ 1/22	6/ 2/22	6/2/22, temp. rose to 103·2°; 23/2/22, losing condition	1/ 4/22	Infected 5 c.c. citrated blood subcutaneously.

* Animal received treatment.

TABLE 3—*continued.*
T. congolense. Artificial Transmission—*continued.*

No.	Animal.	Source of Blood.	Date Sub-inoculated.	Tryps. First Appeared.	Initial Symptoms.	Dead.	Further Remarks.
9	Cat 3	Ox 863, artificial case	28/ 1/22	—	1/2/22, temp. rose to 105°; end of April, 1922, losing condition	20/ 7/22	Infected 5 c.c. citrated blood subcutaneously.
10	Cat 6	Ox 863, artificial case	28/ 1/22	24/ 2/22	7/4/22, losing condition	18/ 6/22	Infected 5 c.c. citrated blood subcutaneously.
11	Cat 7	Ox 863, artificial case	28/ 1/22	—	End of May, 1922, losing condition	16/ 6/22	Infected 5 c.c. citrated blood subcutaneously.
12	Dog 20	Ox 863, artificial case	28/ 1/22	—	—	9/12/22	Killed by companions.
13	Dog 23	Ox 863, artificial case	28/ 1/22	—	14/2/22, temp. rose to 104·4°	Escaped 7/ 3/22	Infected 5 c.c. citrated blood subcutaneously.
14	Dog 26	Ox 863, artificial case	28/ 1/22	25/ 2/22	6/2/22, lachrymation	—	Infected 5 c.c. citrated blood subcutaneously.
15	Goat 4	Ox 863, artificial case	28/ 1/22	—	3/2/22, temp. rose to 104·2°; 28/3/22, lachrymation	—	Infected 5 c.c. citrated blood subcutaneously.
16	Goat 5	Ox 863, artificial case	28/ 1/22	24/ 2/22	1/2/22, temp. rose to 103·2°	—	Infected 5 c.c. citrated blood subcutaneously.
17	Goat 6	Ox 863, artificial case	28/ 1/22	16/ 2/22	30/1/22, temp. rose to 104·8°; 15/2/22, ocular discharge	21/ 3/22	Infected 5 c.c. citrated blood subcutaneously.
18	Sheep 4	Ox 863, artificial case	28/ 1/22	25/ 2/22	2/2/22, temp. rose to 103·4°	—	Infected 5 c.c. citrated blood subcutaneously.
19	Sheep 5	Ox 863, artificial case	28/ 1/22	—	1/2/22, temp. rose to 103·4°	—	Infected 5 c.c. citrated blood subcutaneously.

TABLE 3—continued.
T. congolense. Artificial Transmission—continued.

No.	Animal.	Source of Blood.	Date Sub-inoculated.	Tryps. First Appeared.	Initial Symptoms.	Dead.	Further Remarks.
20	Sheep 6	Ox 863, artificial case	28/ 1/22	—	30/ 1/22, temp. rose to 104·8°	—	Infected 5 c.c. citrated blood subcutaneously.
21	Donkey 14730	Ox 863, artificial case	28/ 1/22	—	3/2/22, temp. rose to 104·8° ; 6/2/22, photophobia	—	Infected 5 c.c. citrated blood subcutaneously.
22	Donkey 14733	Ox 863, artificial case	28/ 1/22	—	17/2/22, temp. rose to 103·2° ; 17/2/22, ocular discharge	—	Infected 5 c.c. citrated blood subcutaneously.
23	Donkey 14735	Ox 863, artificial case	28/ 1/22	—	28/2/22, temp. rose to 103° ; 7/2/22, photophobia and lachrymation	—	Infected 5 c.c. citrated blood subcutaneously.
24	Pig 6	Ox 863, artificial case	28/ 1/22	—	30/1/22, temp. rose to 104·4° ;	—	Infected 5 c.c. citrated blood subcutaneously.
25	Pig 7	Ox 863, artificial case	28/ 1/22	11/ 3/22	30/1/22, temp. rose to 103·4°	—	Infected 5 c.c. citrated blood subcutaneously.
26	Pig 8	Ox 863, artificial case	28/ 1/22	—	30/1/22, temp. rose to 104·2°	—	Infected 5 c.c. citrated blood subcutaneously.
27	Dog 42	Ox 4024, artificial case (mixed <i>T. congolense</i> and <i>T. vivax</i>)	27/ 4/22	<i>T. congolense</i> 5/ 5/22	27/5/22, losing condition ; 30/5/22, temp. rose to 103·9°	12/ 6/22	Infected 50 c.c. citrated blood subcutaneously.
28	Goat 10	Ox 4024, artificial case (mixed <i>T. congolense</i> and <i>T. vivax</i>)	27/ 4/22	<i>T. congolense</i> 12/ 5/22	28/4/22, temp. rose to 103·6° ; 26/5/22, dull	—	Infected 50 c.c. citrated blood subcutaneously.

TABLE 3—continued.
T. congolense. Artificial Transmission—continued.

No.	Animal.	Source of Blood.	Date Sub-inoculated.	Tryps. First Appeared.	Initial Symptoms.	Dead.	Further Remarks.
29	Goat 9	Ox 4024, artificial case (mixed <i>T. congolense</i> and <i>T. vivax</i>)	27/ 4/22	<i>T. congolense</i> 11/ 5/22	9/5/22, temp. rose to 103·2°; 26/5/22, dull	—	Infected 200 c.c. citrated blood subcutaneously.
30	* Cow 343	Ox 4024, artificial case (mixed <i>T. congolense</i> and <i>T. vivax</i>)	27/ 7/22	<i>T. congolense</i> 2/ 8/22	2/8/22, temp. rose to 105·2°, smear <i>B. bigemina</i> ; 10/8/22, oedema of throat	23/8/22	Infected 60 c.c. citrated blood intrajugularly.
31	Donkey 14912	Cow 2646, natural case (mixed <i>T. congolense</i> and <i>T. vivax</i>)	23/ 6/22	<i>T. congolense</i> 13/ 7/22	24/6/22, <i>B. caballi</i> ; 28/6/22, lachrymation	—	Infected 300 c.c. citrated blood intrajugularly.
32	Goat 4582	Cow 2646, natural case (mixed <i>T. congolense</i> and <i>T. vivax</i>)	23/ 6/22	<i>T. congolense</i> 8/7/22	26/6/22, temp. 103°; 30/7/22, dull	—	Infected 200 c.c. citrated blood intrajugularly.
33	Rabbit 16	Ox 863, artificial case	28/ 1/22	—	—	15/ 3/22	Infected 5 c.c. citrated blood intraperitoneally.
34	Rabbit 17	Ox 863, artificial case	28/ 1/22	—	—	20/ 5/22	Infected 5 c.c. citrated blood intraperitoneally.
35	Rabbit 18	Ox 863, artificial case	28/ 1/22	—	—	4/ 6/22	Infected 5 c.c. citrated blood intraperitoneally.
36	Guinea-pig 8	Ox 863, artificial case	28/ 1/22	—	—	Still alive 20/ 2/23	Infected 5 c.c. citrated blood intraperitoneally.
37	White rat 21	Ox 863, artificial case	28/ 1/22	—	—	11/ 3/22	Infected 1 c.c. citrated blood intraperitoneally.

* Animal received treatment.

2. *T. BRUCEI*.

According to the observations made in Zululand, the dog and cat are the most susceptible domesticated animals. For this reason the symptoms relating to these species will be described first.

Dog.

Artificial Infection.—As will be seen in Table 4, the duration of *T. brucei* disease varied from eighteen to thirty-seven days. Trypanosomes were first seen in *stained* blood-smears at periods varying from five to ten days after infection, but had moist preparations been examined their presence would no doubt have been demonstrated earlier. The temperature curve is somewhat characteristic, the initial rise being generally sustained over a period of three to five days. Subsequent elevations are of shorter duration until the last few days before death, when the temperature is irregular, being

T. brucei (Acute Infection).

Dog 24.

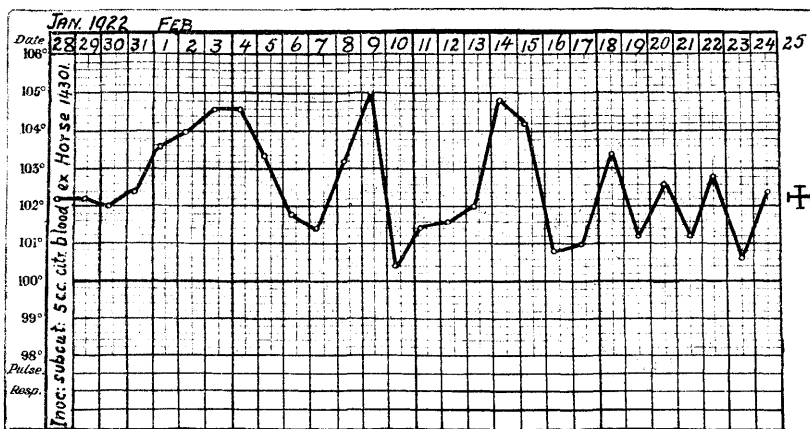


DIAGRAM 4.

high one day and normal or subnormal the next. As would be expected there is a distinct relationship, at any rate during the early stages of the disease, between the temperature and the character of the pulse. During the primary exacerbations the pulse is full and bounding and faster than normal, while during the remissions it is normal. As the disease progresses there is an alteration of tone, the pulse becoming soft, small, and accelerated. Tachycardia is so pronounced during the final stages that at times, especially after the least exertion, the pulse is imperceptible. Also related, to some extent, to the temperature changes is the presence or absence of trypanosomes, the former condition being as a rule associated with a high temperature and the latter with a low. In acute cases, as a rule, the blood teems with parasites during the final stage irrespective of temperature. Probably the first clinical symptom to be observed is photophobia, at first merely a blinking, but later the eyelids being closed or half closed for long periods. Lachrymation or even a slight muco-purulent discharge is generally to be seen in addition. Loss of condition, associated with a progressive

anaemia, is next observed, but dullness and loss of spirits are also noticeable during the early stages. As a rule within a fortnight of infection there is anaemia or jaundice or both, the coat is harsh and staring, loss of condition is marked, the eyelids are suffused, and the corneae either partly or entirely opaque. The respiration has also undergone a change, being shallower and more frequent than normal. Oedematous swellings next make their appearance, dependent parts being naturally involved. The lips, throat, lower abdominal wall, and limbs (and scrotum in the male) become infiltrated with a fluid material which pits on pressure. As the end approaches the sufferer loses all interest in his surroundings, and only now and again attempts to eat his food. In addition to blindness, deafness seems to be a common feature of the disease in canines.

Lethargy is, however, particularly marked. At intervals the condition may suddenly improve, but within a day the patient relapses into a state of drowsiness. At times piercing yells or muffled barks and groans are emitted, and at this stage the sufferer, now reduced to a living skeleton, presents a most pitiable sight. Owing to weakness the animal finally is unable to stand, and death due to exhaustion or dyspnoea mercifully puts an end to all misery.

Natural Infection.—In the one case of natural infection observed throughout the period of illness, trypanosomes were seen ten days after being bitten by *Glossina*. At this time the dog was dull, jaundiced, and refused food. Soon after, ocular changes such as lachrymation, photophobia, turbidity of the aqueous humour, and keratitis appeared. In any case there was no deviation from the type of disease described above. Variations in sequence and character of symptoms frequently occur, but in general the disease may be classed as an acute infection wherein oedema, jaundice, keratitis, and lethargy are more or less constant symptoms.

Cat.

Artificial Infection.—As in the dog, *T. brucei* disease runs an acute course. Of the three cats under observation the duration of the disease varied from seventeen to thirty-one days, and trypanosomes were seen four to seven days after infection. The train of symptoms resembled that described for the dog, except that anasarca and intense jaundice were not observed. As an example of rapid loss of weight may be given the figures relating to Cat 5. This animal weighed 7 lb. on the 2nd January, 1922; twenty-four days later, i.e. at death, it had fallen to 5 lb. 2 oz.

Natural Infection.—No cases were seen, nor is it likely that natural infection occurs, for cats are seldom exposed to the bites of *Glossina*.

Horse.

Artificial Infection.—In the one artificially infected horse under observation the duration of disease was twenty-nine days, trypanosomes being visible on the eighth day after infection. The first noteworthy symptom, one not infrequently observed in recent natural cases of equine infection, was a stiffness of the limbs, which disappeared after a week. The gait in such cases resembled that of subjects affected with acute rheumatism. The temperature, which was taken in the early morning, was characterized by a general irregularity, there being alternating elevations and remissions. The

pulse and appearance of parasites in the peripheral blood stream in relation to the temperature resembled the position as described for the dog. The photophobia and lachrymation were just as marked, but the corneal lesions were far less severe, only transient maculae being observed. Otherwise there was nothing striking except perhaps the absence of lethargy, intense jaundice, and marked keratitis so characteristic of the dog.

Natural Infection.—Several cases were seen for short periods, and the symptoms and course of the disease were generally as indicated above. Whereas in one animal corneal opacities or anasarca might be marked, in another these symptoms would be slight or entirely absent. In all cases the infection ran an acute course.

Mule and Donkey.

Artificial Infection.—No artificially infected mules were under observation, but as naturally infected cases resembled the condition seen in donkeys the above two species are grouped together. The temperature curve in donkeys is irregular, the fever being generally of a remittent type throughout the duration of the disease. The same phenomena regarding pulse and appearance of trypanosomes applies to these species as well. In the cases under observation the duration of the disease varied from forty-eight to sixty days, and trypanosomes first appeared from five to eight days after infection. As in most forms of trypanosomiasis the first evidence of disease is lachrymation, and perhaps a watery discharge from the nose. Soon after, the hair stands on end and a loss of condition is noticed. Another early symptom is drooping of the ears and a tendency to stand in the sun, although the day may be warm. The membrana nictitans becomes pale or slightly jaundiced, and on it are one or more ecchymoses. Oedematous swellings next make their appearance, these being situated as a rule in the breast, belly wall, limbs, and sheath, and scrotum in the male. A peculiar feature about them is their sudden appearance, and less often, their fairly rapid disappearance. The eye lesions are hardly ever so serious as in the dog, but careful observation will generally result in one or more opacities of the cornea being discovered. These too appear and disappear somewhat suddenly; finally loss of condition and anaemia are so marked that the sufferer is not able to graze, any effort to walk causing him to fall. After a varying period exhaustion leads to collapse, and with a few futile kicks the miserable animal breathes his last.

T. brucei (Subacute Infection).

Donkey 14736.

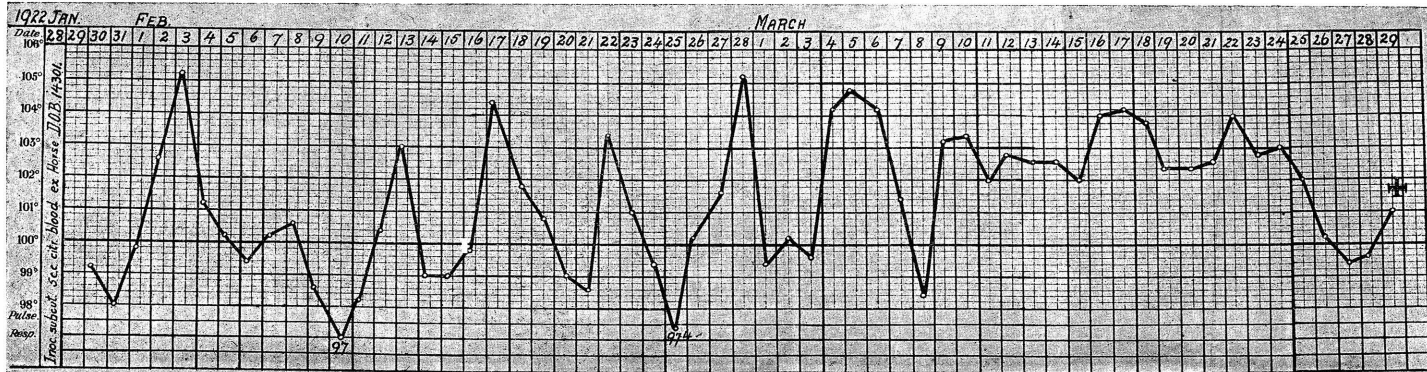


DIAGRAM 5.

Natural Infection.—All there is to add to the above is that natural cases are seen as a rule in transport donkeys, in which case perhaps the first symptom of something amiss is lack of energy. A willing animal shows no desire to pull and hangs back in the harness. If the driver is an experienced man he will immediately pursue his investigations and examine the eyes, which will generally be found either lachrymating or showing flecks on the cornea. When an animal becomes too weak to be of service for transport purposes he is usually unharnessed, left by the wayside and allowed to die, perhaps miles from water. It will be noted that although the symptoms resemble those described for the horse, yet the disease generally lasts longer, and may be said to represent the subacute type of *T. brucei* infection, whereas in the horse an acute form is the rule.

Sheep.

Artificial Infection.—In the three cases under observation the duration of the malady varied from a minimum of 46 days to a maximum of 111 days. Trypanosomes were first seen 33 days after infection. The initial rise of temperature occurred in all cases four days after receiving the virus, and during the course of the fever, which lasted two to three days, over 105° was registered. Thereafter the temperature was inconstant, varying irregularly, as a rule between 101° and 104°. Again eye symptoms were prominent at an early stage, there being photophobia, accompanied by a sticky catarrhal or watery discharge. Later the eyelids were suffused and films formed either partly or entirely over the surface of the cornea. Ecchymoses were also observed on the conjunctiva. Oedema of the throat was next observed, but this symptom, as well as the occurrence of corneal opacities, was only temporary in nature, often disappearing after four or five days to reappear later. Salivation and profuse nasal discharge were also seen. In the final stages respiratory distress was marked, in fact death in each instance being preceded by marked dyspnoea. The course of the disease, as in other species, is characterized by progressive anaemia and loss of condition. Lambs born of two ewes died a few days after birth of malnutrition due to lack of milk.

Natural Infection.—No cases were recognized, but from reports received from natives living in and around fly areas deaths apparently due to *T. brucei* occur in sheep recently introduced from healthy areas.

Goat.

Artificial Infection.—Of the three experimentally infected goats, death followed in from 70 to 191 days, and trypanosomes were never seen after injection of the virus. Symptoms resembled those seen in sheep, with the following exceptions:—Keratitis was more severe, but there was no oedema of the throat nor respiratory distress during the last stages of the malady.

Natural Infection.—No natural cases were seen, but, as in the case of sheep, goats living in and around fly areas are reported to die showing symptoms suggestive of *T. brucei*. It is, however, remarkable that native sheep and goats (and even dogs) appear to exist in Glossina country where it would be impossible for a bovine to live.

Pig.

Artificial Infection.—Of four pigs artificially infected, three died, the minimum period being 330 days, and the maximum 462 days after inoculation. The fourth animal was sold 524 days after infection and appeared in excellent condition at time of disposal. The temperature after the introduction of the virus showed a rise five days later, and the fever persisted for five days. After this, apart from an occasional exacerbation, the temperature remained fairly constant between 102° and 104°. Parasites were first seen at intervals varying from sixteen to thirty days after inoculation, but in all cases they occurred sparingly. In the pig which died 330 days after infection no clinical symptoms were manifested before the fourth month, when a weakness of the hindquarters was noted. This gradually became worse, especially after exercise, when there was interference with locomotion. There was “knuckling over” of fetlock joints, crossing of the hind limbs, and finally collapse. After a rest the animal would rise again with difficulty, and if well cared for, would improve for a time. Relapses usually occurred at monthly intervals, these being sometimes slight, and at other times severe and often accompanied by symptoms suggesting cold. At the same time anaemia and loss of condition became more marked until eventually death occurred from sheer weakness. Occasionally a catarrhal discharge of the eyes was noticed.

Natural Infection.—Cases of *T. brucei* infection have occurred in the Ntambanana Settlement, for positive results have been recorded from the Veterinary Research Laboratory at Maritzburg. On interrogation of the owners, a subacute type of disease is described marked by emaciation and weakness of the hindquarters. After a varying period death follows from exhaustion.

Bovine.

Artificial Infection.—While a chronic type of disease has been described for the pig, yet this form of infection is best seen in the bovine. In the four cases experimentally infected all animals still survive* after a period of two years. In one beast no clinical symptoms, apart from initial rise of temperature, were observed at all, although the parasites could be easily demonstrated in the blood from five to eight days after infection. After a primary fever four or five days after infection, the temperature, apart from occasional marked elevations or remissions, remained more or less constantly between 100° and 102°, which is the normal state of affairs. A chart is appended showing the curve registered by Ox 869, which showed the most marked thermal reaction. Unlike the sheep, goat, and pig, trypanosomes can be demonstrated with little trouble at any rate during the first nine months of the disease. Thereafter they become less frequent and are only present on rare occasions. The first most obvious symptom is a sleepy, dull expression of the eyes, followed by lachrymation. A nasal discharge, usually bilateral, is also an early symptom, as is salivation. A staring coat, loss of condition, and flecks on the cornea also manifest themselves, but these are generally

* June, 1924.

of short duration. An unfavourable spell of weather, such as cold winds or cold rains, causes a reappearance of symptoms. Other frequent symptoms are arched back, drooping ears, and sunken eye-balls. Anaemia is also seen as well as lack of energy, but it was seldom that an animal was unfit for work.

Natural Infection.—No case of pure *T. brucei* disease was seen, but several mixed infections, including *T. congolense*, were observed. In such cases the course of the disease resembled that described for *T. congolense*.

T. brucei (Chronic Infection).

Ox 869.

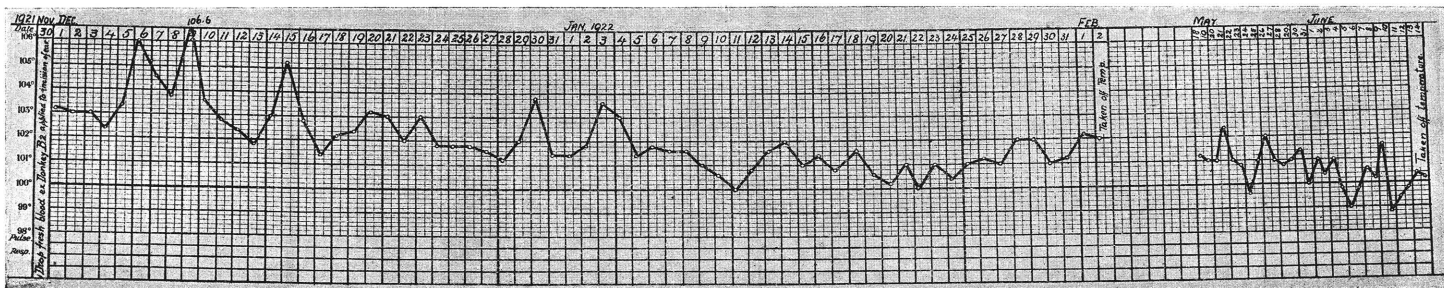


DIAGRAM 6.

In the small laboratory animals the symptoms were in no wise different from those described by other workers. Briefly the following clinical picture was generally observed. *Rabbit*: The duration of the disease varied from thirty-six to eighty-one days, and parasites were as a rule rarely seen in stained blood-smears. Photophobia and lachrymation within ten days of infection were the first clinical manifestations of disease, although in those cases where temperature records were taken an elevation to 104° and over was generally registered on the fourth day. Eye lesions were most prominent throughout; later developments were suffusion of eyelids, injection of conjunctiva, muco-purulent discharge, opacities of cornea, and in some cases blindness. Accompanying this train of symptoms was loss of condition and strength, a dull and listless demeanour, catarrh of nasal passages, and dyspnoea. There was as a rule shedding of fur of face in patches, and where mange co-existed a rapid spread of the latter condition. The fever curve was irregular, but continuously high and the loss of weight varied from 10 to 25 per cent. *Guinea-pig*: The duration of the illness ranged from eleven to forty-seven days after infection, and concurrent with the progressive anaemia and emaciation was dullness and depression. In one case opacity of the cornea was noted. Trypanosomes were occasionally seen in stained blood-smears, and convulsions before death was the rule. *White rat*: The disease lasted from fourteen to forty-seven days, and the most prominent symptoms, apart from anaemia and emaciation, were dullness, cloudiness, and opacity of aqueous humour. In last stages there was coma, but convulsions preceding death were also noted. Trypanosomes occurred fairly regularly in stained blood-smears taken from tail and were not difficult to demonstrate as in the case of the rabbit and guinea-pig. *White mouse*: The length of illness varied from six to thirty days, and depression was the most noticeable symptom. Trypanosomes were as a rule frequent in blood-smears, especially during the latter stages of the disease.

Remarks concerning T. brucei Disease.—From what has been said (and from the description of the malady by others), it is possible to divide the types of disease in domesticated animals as follows:—

- (1) Acute infection represented by the dog, cat, and also horse, their respective susceptibility being in this order.
- (2) Subacute type seen in the mule and donkey, sheep, and goat.
- (3) Chronic infection occurring in the pig and bovine.

Much depends also on the strain of the trypanosome employed, and there is but little doubt if sufficient observations were made, the above types of disease, with perhaps the addition of peracute infection, would be found affecting most species of domesticated animals. In view of the above it is remarkable that the authors of some of the best textbooks on veterinary medicine persist in describing *T. brucei* as being fatal to bovines.

TABLE 4.
T. brucei. Artificial Infection.

No.	Animal.	Source of Blood.	Date Sub-inoculated.	Tryps. First Appeared.	Initial Symptoms.	Dead.	Further Remarks.
1	* Ox 869	Donkey B. 2, natural case	30/11/21	8/12/21	6/12/21, temp. rose to 106°; 16/12/21, lachrymation and nasal catarrh	—	Infected by applying 1 drop of blood to incision of ear.
2	Pig 1	Donkey B. 2, natural case	30/11/21	16/12/21	7/12/21, temp. rose to 107·4°; June, 1922, losing condition and weak	26/10/22	Infected by applying 1 drop of blood to incision of ear.
3	Rabbit 6	Donkey B. 2, natural case	30/11/21	5/12/21	5/12/21, temp rose to 105·4°; 15/12/21, ocular catarrh	6/ 1/22	Infected by applying 1 drop of blood to incision of ear.
4	Guinea-pig 3	Donkey B. 2, natural case	30/11/21	7/12/21	14/12/21, temp. rose to 103°	27/12/21	Infected by applying 1 drop of blood to incision of ear.
5	* Dog 15	Rabbit 6, artificial case	2/ 1/22	10/ 1/22	8/1/22, temp. rose to 104°; 21/1/22, oedema of throat and ocular discharge	6/ 2/22	Infected by touching incision of ear with drop of blood.
6	* Dog 16	Rabbit 6, artificial case	2/ 1/22	10/ 1/22	8/1/22, temp. rose to 104·2°; 18/1/22, oedema of lips	5/ 2/22	Infected by touching incision of ear with drop of blood.
7	Horse 14301	Rabbit 6, artificial case	6/ 1/22	14/ 1/22	15/1/22, temp. rose to 104°; 7/1/22, stiff in all limbs	4/ 2/22	Infected 1 c.c. citrated blood subcutaneously.
8	White rat 18	Horse 14301, artificial case	28/ 1/22	11/ 2/22	—	11/ 2/22	Infected 1 c.c. citrated blood intraperitoneally.

* Animal received treatment.

TABLE 4—*continued.*
T. brucei. Artificial Infection—*continued.*

No.	Animal.	Source of Blood.	Date Sub-inoculated.	Tryps. First Appeared.	Initial Symptoms.	Dead.	Further Remarks.
9	White rat 19	Horse 14301, artificial case	28/ 1/22	13/ 2/22	—	16/ 3/22	Infected 1 c.c. citrated blood intraperitoneally.
10	White rat 20	Horse 14301, artificial case	28/ 1/22	13/ 2/22	—	9/ 3/22	Infected 1 c.c. citrated blood intraperitoneally.
11	Cat 2	Horse 14301, artificial case	28/ 1/22	1/ 2/22	3/2/22, temp. rose to 104·2°; 10/2/22, losing condition	14/ 2/22	Infected 1 c.c. citrated blood subcutaneously.
12	Cat 4	Horse 14301, artificial case	28/ 1/22	4/ 2/22	31/1/22, temp. rose to 102·8°; 21/2/22, losing condition	Escaped 28/ 2/22	Infected 1 c.c. citrated blood subcutaneously.
13	Cat 5	Horse 14301, artificial case	28/ 1/22	3/ 2/22	2/2/22, temp. rose to 102·8°; 10/2/22, photophobia	25/ 2/22	Infected 1 c.c. citrated blood subcutaneously.
14	Dog 10	Horse 14301, artificial case	28/ 1/22	2/ 2/22	30/1/22, temp. rose to 104°; 1/2/22, ocular discharge	15/ 2/22	Infected 5 c.c. citrated blood subcutaneously.
15	Dog 24	Horse 14301, artificial case	28/ 1/22	2/ 2/22	1/2/22, temp. rose to 103·6°; 6/2/22, photophobia	24/ 2/22	Infected 5 c.c. citrated blood subcutaneously.
16	Dog 25	Horse 14301, artificial case	28/ 1/22	2/ 2/22	2/2/22 temp. rose to 104·8°; 7/2/22, dull and losing condition	20/ 2/22	Infected 5 c.c. citrated blood subcutaneously.
17	Goat 1	Horse 14301, artificial case	28/ 1/22	*	2/2/22, temp. rose to 106°; 21/3/22, losing weight	8/ 4/22	Infected 5 c.c. citrated blood subcutaneously.

* Blood examined 36 times during course of disease, but always with negative result.

TABLE 4—continued.

T. brucei. Artificial Infection—continued.

No.	Animal.	Source of Blood.	Date Sub-inoculated.	Tryps. First Appeared.	Initial Symptoms.	Dead.	Further Remarks.
18	Goat 2	Horse 14301, artificial case	28/ 1/22	*	2/2/22, temp. rose to 103°; 21/3/22, lachrymation	7/ 8/22	Infected 5 c.c. citrated blood subcutaneously.
19	Goat 3	Horse 14301, artificial case	28/ 1/22	†	30/1/22, temp. rose to 103°; 21/2/22, lachrymation	24/ 4/22	Infected 5 c.c. citrated blood subcutaneously.
20	Sheep 1	Horse 14301, artificial case	28/ 1/22	7/ 3/22	2/2/22, temp. rose to 106°; 10/2/22, photophobia	21/ 4/22	Infected 5 c.c. citrated blood subcutaneously.
21	Sheep 2	Horse 14301, artificial case	28/ 1/22	2/ 3/22	2/2/22, temp. rose to 106·2°; 15/2/22, ocular discharge	15/ 3/22	Infected 5 c.c. citrated blood subcutaneously.
22	Sheep 3	Horse 14301, artificial case	28/ 1/22	‡	1/2/22, temp. 105·2°; 18/4/22, lachrymation	19/ 5/22	Infected 5 c.c. citrated blood subcutaneously.
23	Donkey 14729	Horse 14301, artificial case	28/ 1/22	3/ 2/22	3/2/22, temp. rose to 104·6°; 11/2/22, photophobia and lachrymation	17/ 3/22	Infected 5 c.c. citrated blood subcutaneously.
24	Donkey 14731	Horse 14301, artificial case	28/ 1/22	2/ 2/22	4/2/22, temp rose to 104·2°; 10/2/22, photophobia	25/ 3/22	Infected 5 c.c. citrated blood subcutaneously.
25	Donkey 14736	Horse 14301, artificial case	28/ 1/22	2/ 2/22	3/2/22, temp. rose to 105·2°; 6/2/22, photophobia	29/ 3/22	Infected 5 c.c. citrated blood subcutaneously.
26	Ox 864	Horse 14301, artificial case	28/ 1/22	4/ 2/22	4/2/22, temp. rose to 103·6°; 15/2/22, ocular discharge	—	Infected 5 c.c. citrated blood subcutaneously.

* Blood examined 43 times during course of disease, but always with negative result.

† " " 38 " " " " " " " " " "

‡ " " 39 " " " " " " " " " "

TABLE 4—continued.
T. brucei. Artificial Infection—continued.

No.	Animal.	Source of Blood.	Date Sub-inoculated.	Tryps. First Appeared.	Initial Symptoms.	Dead.	Further Remarks.
27	Ox 865	Horse 14301, artificial case	28/ 1/22	4/ 2/22	3/2/22, temp. rose to 104°; 21/2/22, nasal catarrh	—	Infected 5 c.c. citrated blood subcutaneously.
28	Ox 875	Horse 14301, artificial case	28/ 1/22	2/ 2/22	15/2/22, eyes dull	--	Infected 5 c.c. citrated blood subcutaneously.
29	Pig 3	Horse 14301, artificial case	28/ 1/22	27/ 2/22	30/1/22, temp. rose to 103·8°	—	Infected 5 c.c. citrated blood subcutaneously.
30	Pig 4	Horse 14301, artificial case	28/ 1/22	15/ 2/22	2/2/22, temp. rose to 104°	22/ 4/23	Infected 5 c.c. citrated blood subcutaneously.
31	Fig 5	Horse 14301, artificial case	28/ 1/22	27/ 2/22	2/2/22, temp. rose to 105°	5/ 5/23	Infected 5 c.c. citrated blood subcutaneously.
32	White mouse 1	Horse 14301, artificial case	28/ 1/22	2/ 2/22	—	5/ 2/22	Infected 1 c.c. citrated blood intraperitoneally.
33	White mouse 2	Horse 14301, artificial case	28/ 1/22	2/ 2/22	—	5/ 2/22	Infected 1 c.c. citrated blood intraperitoneally.
34	White mouse 3	Horse 14301, artificial case	28/ 1/22	2/ 2/22	—	7/ 2/22	Infected 1 c.c. citrated blood intraperitoneally.
35	Guinea-pig 5	Horse 14301, artificial case	28/ 1/22	6/ 2/22	—	8/ 2/22	Infected 1 c.c. citrated blood intraperitoneally.
36	Guinea-pig 6	Horse 14301, artificial case	28/ 1/22	11/ 2/22	--	9/ 3/22	Infected 1 c.c. citrated blood intraperitoneally.
37	Guinea-pig 7	Horse 14301, artificial case	28/ 1/22	13/ 2/22	--	14/ 3/22	Infected 1 c.c. citrated blood intraperitoneally.

TABLE 4—continued.

T. brucei. Artificial Infection—continued.

No.	Animal.	Source of Blood.	Date Sub-inoculated.	Tryps. First Appeared.	Initial Symptoms.	Dead.	Further Remarks.
38	Rabbit 13	Horse 14301, artificial case	28/ 1/22	11/ 2/22	30/1/22, temp. rose to 103·6°; 7/2/22, photophobia	20/ 4/22	Infected 5 c.c. citrated blood intraperitoneally.
39	Rabbit 14	Horse 14301, artificial case	28/ 1/22	13/ 2/22	30/1/22, temp. rose to 104°; 8/2/22, lachrymation	6/ 3/22	Infected 5 c.c. citrated blood intraperitoneally.
40	Rabbit 15	Horse 14301, artificial case	28/ 1/22	11/ 2/22	30/1/22, temp. rose to 103°; 11/2/22, opacity of eye	8/ 3/22	Infected 5 c.c. citrated blood intraperitoneally.
41	Donkey 14738	Ox 865, artificial case	10/ 8/22	18/ 8/22	16/8/22, temp. rose to 102°; 15/8/22, dull	29/ 9/22	Infected 50 c.c. citrated blood intrajugularly.
42	Dog 8	Ox 869, artificial case	20/ 6/22	30/ 6/22	28/6/22, temp. rose to 104°; 1/7/22, losing condition	22/ 7/22	Infected 20 c.c. fresh blood subcutaneously.
43	* Dog 56	Dog 8, artificial case	3/ 7/22	11/ 7/22	6/7/22, temp. rose to 103·4°; 10/7/22, ocular discharge	27/ 7/22	Infected by touching incision of ear with drop of blood.
44	Dog 55	Dog 8, artificial case	3/ 7/22	11/ 7/22	6/7/22, temp. rose to 103°; 9/7/22, lachrymation	9/ 8/22	Infected by touching incision of ear with drop of blood.
45	White rat 13	Donkey B. 3, natural case	10/ 1/22	27/ 1/22	—	8/ 3/22 (killed <i>in extremis</i>)	Infected 1 c.c. citrated blood intraperitoneally.
46	Dog 19	White rat 13, artificial case	8/ 3/22	14/ 3/22	—	1/ 4/22	Infected 3 c.c. fresh blood subcutaneously.

* Animal received treatment.

TABLE 4—*continued.*

No.	Animal.	Source of Blood.	Date Sub-inoculated.	Tryps. First Appeared.	Initial Symptoms.	Dead.	Further Remarks.
47	Dog 41	Rabbit 13, artificial case	20/ 4/22	25/ 4/22	21/4/22, temp. rose to 103·6° ; 1/5/22, photophobia and dull	10/ 5/22	Infected 12 c.c. citrated blood subcutaneously.
48	White mouse 4	Horse 14301, artificial case	28/ 1/22	2/ 2/22	—	11/ 2/22	Infected 1 c.c. citrated blood intraperitoneally.
49	White mouse 5	Horse 14301, artificial case	28/ 1/22	3/ 2/22	—	28/ 2/22	Infected 1 c.c. citrated blood intraperitoneally.
50	White mouse 6	Horse 14301, artificial case	28/ 1/22	3/ 2/22	—	4/ 2/22	Infected 1 c.c. citrated blood intraperitoneally.
51	White rat 23	Horse 14301, artificial case	28/ 1/22	13/ 2/22	—	2/ 3/22	Infected 1 c.c. citrated blood intraperitoneally.
52	* Wild rat 1	Horse 14301, artificial case	28/ 1/22	23/ 2/22	—	5/ 4/22	Infected 1 c.c. citrated blood intraperitoneally.
53	* Wild rat 2	Horse 14301, artificial case	28/ 1/22	4/ 3/22	—	4/ 4/22	Infected 1 c.c. citrated blood intraperitoneally.
54	Rabbit M. 1	Donkey 14731, artificial case	22/ 3/22	†	—	20/ 4/22	Infected 15 c.c. citrated blood intraperitoneally.
55	Rabbit M. 2	Donkey 14736, artificial case	22/ 3/22	†	—	27/ 4/22	Infected 5 c.c. citrated blood intraperitoneally.

* *Rattus natalensis.*

† No record kept of first appearance of trypanosomes in blood.

TABLE 4—*continued.*

No.	Animal.	Source of Blood.	Date Sub-inoculated.	Tryps. First Appeared.	Initial Symptoms.	Dead.	Further Remarks.
56	Guinea-pig M. 1	Donkey 14731, artificial case	22/ 3/22	†	—	14/ 4/22	Infected 5 c.c. citrated blood intraperitoneally.
57	Guinea-pig M. 2	Donkey 14736, artificial case	22/ 3/22	†	—	8/ 5/22	Infected 1 c.c. citrated blood intraperitoneally.
58	Wild rat 3	Horse 14301, artificial case	28/ 1/22	4/ 3/22	—	11/ 4/22	Infected 5 c.c. citrated blood intraperitoneally.
59	Guinea-pig 9	Horse 14301, artificial case	28/ 1/22	14/ 2/22	—	12/ 4/22	Infected 5 c.c. citrated blood intraperitoneally.
60	Guinea-pig 10	Horse 14301, artificial case	28/ 1/22	14/ 2/22	—	5/ 4/22	Infected 5 c.c. citrated blood intraperitoneally.

* *Rattus natalensis.*

† No record kept of first appearance of trypanosomes in blood.

3. *T. VIVAX*.

This trypanosome was met with on eighteen occasions in bovines, and of this number six animals were submitted to tartar emetic treatment. In all cases the infection appeared to be pure, but it is possible that in some cases *T. congolense* was present as well. In addition to the above, *T. vivax* was seen in the blood of two game animals, a warthog and a duiker, in hanging drop preparations of citrated blood.

Artificial Infection.—Only one case was obtained (Ox 4024), but unfortunately this animal was also suffering from *T. congolense*. It was found most difficult to transmit *T. vivax* by artificial injections of blood, and in the only case which succeeded (Ox 4024 from Cow Cry 1) fresh blood was used, whereas in the remaining attempts citrated blood was employed. Jowett (1910) also experienced the same difficulty, and although he made several attempts, he failed each time.* A tabulated statement is appended showing particulars regarding sub-inoculations. (See Table 5.)

T. vivax.

Ox 675.

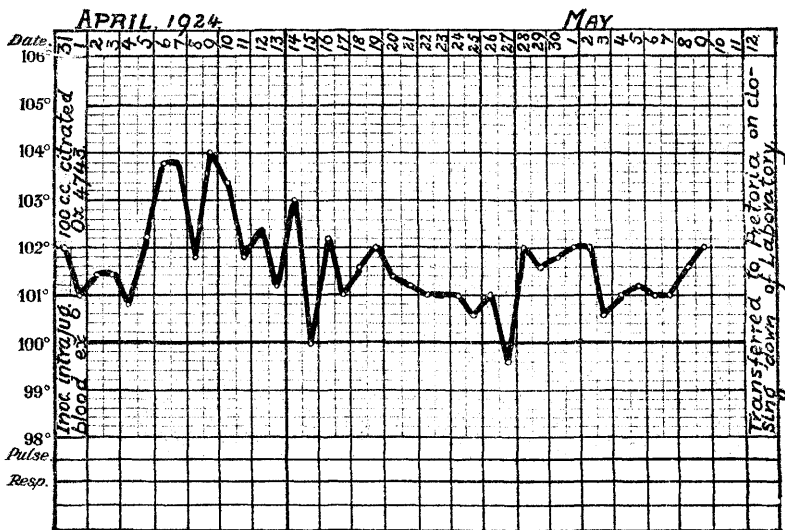


DIAGRAM 7.

Natural Infection.—The symptoms in the eighteen cases referred to above resembled very closely those seen in *T. congolense* disease. In three untreated animals the malady pursued a fairly rapid course, and ended fatally; one of the six bovines treated, an old cow, died in spite of tartar emetic. The remaining nine untreated animals are

* It will be seen that the experience of the writer coincides with that of Hornby (1923), who describes *T. vivax* "as generally less pathogenic than the smaller species, but undoubtedly many cattle succumb to natural infection." Report of the proceedings of the Fifth Pan-African Veterinary Conference, Nairobi, April, 1923.

reported to have recovered, but whether a relapse occurred later it is not known. Parasites were generally scanty in blood-smears, the largest number in one field never having exceeded three.*

No mention is made of post-mortem appearances in this paper as it is intended to write up the pathology of the various forms of trypanosomiasis for a subsequent report, and to include post-mortem appearances therein.

* Blood-smears showing a heavy infection of *T. vivax* have been seen, one from Angola (T. Meyer, 1923) and another at Onderstepoort (Dr. Berg, 1924).