

animals suffering from East Coast fever, (*b*) by imagines of *Rhipicephalus appendiculatus*, *evertsi*, and *capensis*, all of which had infected themselves as nymphæ.

### *Conclusions.*

*Rhipicephalus decoloratus* and *amblyomma hebræum* must not be considered as hosts of *piroplasma parvum*.

*Rhipicephalus appendiculatus*, *evertsi*, *capensis*, *simus*, and, according to Lounsbury, also *nitens*, must be considered to be hosts of *piroplasma parvum*. It may safely be concluded that *piroplasma parvum* in its life cycle of development does not pass through the egg, and finally it is evident that immune animals do not carry the infection.

---

### “D.”—RESULTS OF HORSE-SICKNESS INOCULATION IN PRACTICE DURING 1906-1907.

The inoculation of mules against horse-sickness was recommenced from July, 1906, by the respective Government Veterinary Surgeons of the following districts:—Barberton, Lydenburg, Pretoria, Johannesburg, Krugersdorp, Potchefstroom, Wakkerstroom (Piet Retief and Volksrust), Zoutpansberg, Marico, Rustenburg, Waterberg, Ermelo, Standerton and Heidelberg. The immunisation was also performed in Rhodesia, Natal, Orange River Colony and Bechuanaland Protectorate.

Up to June, 1906, the virus and serum utilised was known as the “Ordinary” strain, but in experimenting I found that a virus from Tzaneen was able to break the immunity conferred by the Ordinary strain, and accordingly it was introduced into practice, as I considered it would afford a better protection. This Tzaneen strain gave good results until December, when from reports which came to hand, it was evident that in some cases it had become avirulent. Further inoculations with Tzaneen virus were accordingly discontinued, and I reverted back to the Ordinary strain. As this avirulency was contrary to previous experience, a thorough investigation was undertaken, but so far I am unable to adduce any reasons for it. Some 230 mules had been inoculated with this inert virus before any steps could be taken, and about 17 had died. The remainder were reinoculated with the Ordinary strain, and the chances of further mortality reduced to a minimum, also the owners of mules which had died owing to the inoculation with inert virus received compensation.

These inoculations and deaths from inert virus have not been included in any of the following tables, but all reinoculations have been taken into consideration.

## (a) RESULTS IN THE TRANSVAAL.

*Number of mules inoculated and number which died from  
July, 1906, to June, 1907.*

District.	Number Inoculated.	Deaths.	Percentage.
Barberton ... ..	80	3	3.7
Krugersdorp ... ..	20	2	10.0
Lydenburg ... ..	280	6	2.1
Middelburg ... ..	133	4	3.0
Wakkerstroom ... ..	268	17	6.4
Potchefstroom ... ..	100	5	5.0
Pretoria District ... ..	804	35	4.3
Pretoria Experimental Station ... ..	236	13	5.5
Rustenburg ... ..	380	13	3.4
Waterberg ... ..	220	4	1.8
Marico ... ..	102	3	3.0
Zoutpansberg ... ..	536	20	3.7
Ermelo ... ..	198	12	6.0
Standerton ... ..	23	1	4.3
Heidelberg ... ..	11	0	0
TOTAL ... ..	3,391	138	4.0

The following table gives the number of mules inoculated monthly in the various districts, excluding those immunised at this Station (236):—

*Monthly inoculations.*

Month.	NUMBER OF MULES.				
	On Hand.	Inoculated.	Dis- charged.	Which Died.	Remain- ing.
1906—July ... ..	25	76	26	10	65
August ... ..	65	28	65	1	27
September ... ..	27	43	28	1	41
October ... ..	41	245	113	11	162
November ... ..	162	367	253	15	261
December ... ..	261	582	494	23	326
1907—January ... ..	326	705	513	21	497
February ... ..	497	332	555	10	264
March ... ..	264	423	413	12	262
April ... ..	262	222	374	11	99
May ... ..	99	54	144	7	2
June ... ..	2	78	67	3	10
TOTAL ... ..	—	3,155	3,045	125	10

## (b) OTHER COLONIES.

Horse-sickness serum and virus was issued to several South African Colonies, and all the inoculations were performed by qualified officials.

Natal inoculated 1,170 mules, of which 59 died, or 5 per cent. (excluding deaths from inert virus).

Rhodesia immunised 972 mules, with deaths amounting to 21, or 2 per cent. (excluding casualties with inert virus).

35 mules were immunised in the Bechuanaland Protectorate, of which 3 died—8 per cent.

In the Orange River Colony 24 mules were inoculated, with the result that 1 died—4 per cent.

In Swaziland 76 mules were inoculated, of which 4 died—5.2 per cent.

The total being 2,277 inoculated, of which 88 died—3.8 per cent.

## (c) RELAPSES AMONGST IMMUNISED MULES WHEN EXPOSED TO NATURAL INFECTION.

Towards the end of the season, statistics were collected in regard to the number of mules which died after discharge.

The majority of deaths were reported, but the figures cannot be regarded as quite accurate, since in many cases the diagnosis of horse-sickness would appear to be doubtful.

For the purposes of comparison I have classified these deaths under the various districts, although in several instances mules have died in a different district to where they were immunised.

*Statement showing number of mules inoculated in the Transvaal since November, 1905, together with the mortality during inoculation and after discharge.*

District.	Number of Mules Inoculated from Nov., 1905, to June, 1907.	Number of Mules which died during Inoculation from Nov., 1905, to June, 1907.	Number of Immunised Mules which died after exposure from Nov., 1905, to June, 1907.	Total Number of Mules which died as a result of and after Inoculation.	Total per Cent. of Deaths to Number Inoculated.
					Per Cent.
Barberton ... ..	267	6	8	14	5
Krugersdorp ... ..	55	3	1	4	7
Lydenburg ... ..	386	10	12	22	6
Middelburg ... ..	204	6	5	11	5
Wakkerstroom ... ..	372	22	7	29	8
Potchefstroom ... ..	259	10	6	16	6
Pretoria ... ..	1,459	63	17	80	6
Rustenburg ... ..	873	31	16	47	5
Waterberg ... ..	394	14	4	18	5
Marico ... ..	150	4	0	4	3
Zoutpansberg ... ..	850	27	10	37	4
Heidelberg ... ..	17	—	—	—	0
Ernelo ... ..	198	12	3	15	8
Standerton ... ..	23	1	0	1	4
	5,498	209	89	298	5.4

*(d) SPONTANEOUS CASES OF HORSE-SICKNESS.*

The 1906-1907 season was the worst experienced for many years, mules dying in districts which hitherto were considered as being almost free from the disease, and the mortality in the recognised horse-sickness districts being correspondingly high.

In Ermelo 800 horses were reported as dying from horse-sickness and 200 non-inoculated mules. In Potchefstroom (including Wolmaransstad and Bloemhof) 1,542 horses died, and 222 non-inoculated mules.

The following statement contains all the statistics received:—

*Deaths amongst horses and non-inoculated mules from horse-sickness during 1906-7.*

District.	DEATHS AMONGST		Total.
	Horses.	Non-Inoculated Mules.	
Barberton ... ..	—	—	81
Krugerdsorp ... ..	58	12	70
Lydenburg ... ..	204	69	273
Potchefstroom ... ..	1,542	222	1,764
Pretoria ... ..	504	71	575
Rustenburg ... ..	—	—	295
Zeerust ... ..	—	—	300
Zoutpansberg ... ..	352	96	448
Swaziland ... ..	—	—	80
Heidelberg ... ..	537	64	601
Ermelo ... ..	800	200	1,000
Standerton ... ..	—	—	500
Lichtenburg ... ..	786	—	786
Middelburg (no returns)			
Waterberg ..			6,773
Piet Retief ..			
Wakkerstroom ..			

*(e) TOTAL RESULTS.*

The total number of mules inoculated in the Transvaal, Natal, Rhodesia, Orange River Colony, Bechuanaland Protectorate from November, 1905, to June, 1907, is 8,766, of which 329 died during inoculation—3.7 per cent.—and 112 died after exposure. That is to say, of 8,766 mules treated by our immunisation method, 8,325 survived the inoculation and were proof against natural infection, and in view of the severe nature of the disease last season, I consider these results very satisfactory.