

F.—HORSE-SICKNESS.

From the first two horses (2915 and 2917) the following physical-chemical characteristics were examined :—

- (1) Temperature of the body.
- (2) Volume of erythrocytes.
- (3) Viscosity of blood.
- (4) Viscosity of serum.
- (5) Specific gravity of serum.
- (6) Conductivity of serum.
- (7) Coefficient of thermal expansion.
- (8) Quantity of daily urine.
- (9) Viscosity of urine.
- (10) Specific gravity of urine.
- (11) Conductivity of urine.
- (12) Alkalinity of urine.*
- (13) Quantity of drinking water.

Both horses were injected on the 8th October, 1907, subcutaneously with 2 c.c. virus CD 2884 and 300 c.c. polyvalent serum 186. Both have to be considered to be immune to a certain extent, for they had passed a slight experimental horse-sickness attack. The examinations were started seventeen days before infection and—as in piroplasmosis—made daily for two months. After an interval of two and a half months they were taken up again—the 9th February, 1908—and in addition to the above-mentioned characteristics, surface tension and specific gravity of blood, and surface tension and alkalinity of serum were investigated, whilst the coefficient of expansion and amount of drinking water were left out.

After hyperimmunisation, the 25th and 26th February, 1908, amounting to 10,000 c.c. virus 3375 in each horse, T strain, 18th gen. (inadequate to immunisation), both contracted horse-sickness, of which 2917 died on 3rd March, 1908, 2915 recovered, but succumbed a few days later to piroplasmosis and sequels of horse-sickness on 9th March, 1908.

* The alkalinity of serum and urine is indicated by the quantity of neutralisation—water *pro* litre serum and urine respectively.

HORSE 2915.

Date.	TEMPERATURE.		BLOOD.		SERUM.				Drink-water.	Temperature, 9 a.m.	URINE.					CLINICAL OBSERVATIONS.
	Morning.	Evening.	Volume of Blood Corpuscles.	Viscosity at 77° F.	Viscosity at 77° F.	Specific Gravity at 98° 6.	Coefficient of Expansion 71° 6 - 98° 6.	Conductivity at 98° 6 × 10 ⁻⁴ .			Quantity.	Viscosity at 37°.	Alkalinity.	Conductivity at 98° 6 × 10 ⁻⁴ .	Specific Gravity at 98° 6.	
Sept. 20	—	—	%	—	—	—	—	146.9	—	—	—	—	—	—	—	
" 21	99.4	100.8	46	—	—	—	—	—	3	—	—	—	—	—	—	
" 22	99.4	100.4	45	—	—	—	—	143.8	3	—	—	—	—	—	—	
" 23	99.6	100.6	46	—	—	—	—	145.5	10	—	2.5	—	4.0	320	1.024	
" 24	100.0	100.6	45	—	—	—	—	143.5	10	—	2.7	—	3.2	336	1.026	
" 25	99.6	101.0	43	—	—	—	—	142.5	10	—	4.4	—	2.9	353	1.023	
" 26	99.4	101.0	42	—	—	—	—	146.7	17.5	—	—	—	7.2	536	1.032	
" 27	99.6	101.0	43	—	—	—	—	146.2	18	—	3.3	—	5.8	453	1.037	
" 28	100.0	101.0	43	—	—	—	—	146.2	20	—	2.3	—	6.5	502	1.039	
" 29	100.6	100.6	—	—	1.78	—	—	146.8	—	—	—	—	—	—	—	
" 30	100.6	100.6	41	—	1.73	—	—	147.5	20	—	1.6	—	9.0	664	1.042	
Oct. 1	100.0	101.6	40	—	1.68	1.0280	—	145.5	8	—	2.5	—	3.2	392	1.028	
" 2	100.4	101.4	39	3.65	1.68	1.0275	—	146.7	10	—	3.8	—	4.0	427	1.024	
" 3	100.0	101.4	39	4.60	1.80	1.0280	0.00032	147.1	14	70	3.4	—	6.5	540	1.036	
" 4	99.2	101.0	40	4.30	1.80	1.0286	0.00032	144.9	16.5	70	4.6	—	4.7	445	1.038	
" 5	100.2	102.6	39	3.95	—	1.0271	0.00034	144.5	9	67	—	—	6.8	495	—	
" 6	100.4	101.2	39	—	—	1.0283	0.00033	143.8	—	61	0.9	—	8.3	611	1.033	
" 7	99.0	100.8	44	—	1.87	1.0300	0.00034	143.3	11	56	2.5	—	7.2	618	1.038	
" 8	98.6	101.0	39	4.00	1.68	1.0282	0.00034	144.3	9	61	4.0	—	4.3	448	1.026	
											3.4	—	5.8	465	1.027	
" 9	100.4	101.4	38	3.90	1.70	1.0274	0.00034	145.5	6	65	4.0	—	5.0	550	1.029	
" 10	99.2	101.4	37	4.20	1.80	1.0280	0.00033	144.9	10	72	3.0	—	6.5	606	1.029	
" 11	99.6	101.6	36	3.85	1.77	1.0280	0.00033	144.3	11	74	3.8	—	5.4	530	1.029	
" 12	100.2	101.0	—	4.15	1.78	—	—	143.2	7	65	3.0	—	—	596	1.032	
" 13	99.6	101.0	38	4.05	1.78	1.0288	0.00032	145.4	15	67	3.8	—	4.3	697	1.029	
" 14	99.0	101.4	40	4.15	1.78	1.0286	0.00033	146.3	16	67	5.2	—	4.7	680	1.029	

Injected subcutaneously:
300 c.c. polyvalent serum
186. 2 c.c. virus CD
2884.

..	15	100-0	100-4	38	4-60	1-74	1-0286	0-00033	149-0	15	68	7-0	1-10	3-6	604	1-023	—
..	16	99-2	102-4	40	4-65	1-70	1-0299	0-00034	145-4	7	70	5-6	1-05	4-0	587	1-025	—
..	17	101-0	104-0	38	3-95	1-72	1-0282	0-00033	148-8	22	74	5-6	1-15	4-3	726	1-028	Pulse 44.
..	18	101-8	104-6	37	4-80	1-70	1-0285	0-00034	145-5	16-5	76	—	1-15	5-4	736	1-028	48.
..	19	102-4	104-0	37	4-00	1-60	1-0285	—	143-2	18	72	4-4	1-10	4-7	533	1-025	„ 56.
..	20	103-2	103-0	36	3-35	1-60	1-0260	0-00033	144-1	4	59	5-0	1-20	3-6	326	1-021	„ 40.
..	21	102-0	103-6	34	3-10	1-68	1-0255	0-00033	144-5	12	65	0-9	1-15	7-2	600	1-028	„ 48.
..	22	102-6	103-6	36	3-70	1-55	1-0253	0-00032	145-4	14-5	72	2-8	1-18	6-8	508	1-022	—
..	23	100-6	102-0	35	3-65	1-70	1-0245	0-00034	148-6	16	77	2-8	1-22	9-7	648	1-036	Pulse 50.
..	24	99-6	101-0	34	3-55	1-64	1-0237	—	149-3	11	77	2-6	1-35	6-5	513	1-038	Slight dikkop.
..	25	99-6	101-0	34	3-30	1-48	1-0240	0-00032	147-8	4-5	70	5-2	1-05	2-5	385	1-023	„ 56.
..	26	99-0	100-8	36	3-75	1-38	1-0260	—	147-5	3-5	63	3-7	1-05	4-3	589	1-032	„ 60.
..	27	99-8	100-8	37	3-75	1-28	1-0261	0-00032	145-5	4-5	63	3-7	1-18	4-7	616	1-031	Dikkop disap.
..	28	100-0	100-8	34	3-40	1-66	1-0262	0-00032	147-9	10	68	4-4	1-20	6-1	569	1-035	„ 48.
..	29	99-2	102-2	36	3-60	1-67	1-0269	0-00033	144-9	10	68	3-7	1-20	6-1	566	1-038	—
..	30	99-2	100-4	36	3-40	1-77	1-0270	0-00033	146-1	6	63	4-0	1-12	6-1	494	1-044	—
..	31	99-0	101-8	36	3-40	1-77	1-0271	0-00033	144-1	4-5	63	4-7	1-10	3-1	436	1-021	—
Nov.	1	99-0	100-6	38	4-50	1-78	1-0275	0-00032	144-1	3	63	3-0	1-20	5-8	632	1-036	—
..	2	99-2	100-4	36	4-10	1-70	1-0276	—	146-8	15	67	4-4	1-15	5-0	—	1-035	—
..	3	99-0	100-8	37	4-00	1-70	1-0280	0-00032	145-5	10	68	1-9	1-26	5-8	616	1-039	—
..	4	98-4	100-6	36	3-60	1-84	1-0276	0-00032	147-2	15	72	2-5	1-15	5-4	586	1-037	—
..	5	100-4	101-6	36	4-10	1-74	1-0274	0-00032	146-1	14-5	72	5-6	1-10	4-7	384	1-020	—
..	6	98-6	100-8	38	3-95	1-73	1-0276	0-00034	147-4	18	72	3-9	1-05	3-2	658	1-025	—
..	7	99-0	102-6	35	3-70	1-85	1-0276	0-00033	145-5	7-5	70	3-0	1-15	6-8	696	1-034	—
..	8	99-4	100-0	36	3-60	1-82	1-0271	—	—	8-5	70	3-1	1-25	—	—	—	—
..	9	99-0	101-4	—	3-90	1-80	1-0275	—	146-2	21	—	5-6	1-08	—	—	—	—
..	10	99-0	100-6	—	4-00	1-80	1-0271	—	—	8	—	3-6	1-08	4-0	443	1-020	—
..	11	99-0	101-6	40	4-50	1-80	1-0286	0-00032	143-9	13-5	72	1-9	1-12	6-5	523	1-030	—
..	12	99-2	100-4	39	4-65	1-90	1-0274	0-00032	144-7	9	74	2-1	1-15	6-8	557	1-029	—
..	13	98-6	101-0	36	4-05	1-68	1-0271	0-00032	147-2	18	76	—	1-05	5-8	508	—	—
..	14	99-6	100-8	36	3-90	1-88	1-0272	0-00033	148-9	11	72	1-5	1-24	6-8	687	1-035	—
..	15	99-0	100-6	37	4-05	1-75	1-0272	0-00032	146-9	6	67	3-5	1-20	6-8	629	1-042	—
..	16	99-6	100-2	34	3-55	1-78	1-0259	—	148-3	16	70	6-9	1-10	3-2	355	1-016	—
..	17	99-6	100-6	36	3-55	1-86	1-0271	0-00032	147-4	7	68	4-5	1-12	2-7	359	1-019	—
..	18	99-4	100-8	37	3-55	1-66	1-0272	0-00032	144-3	7-5	67	4-3	1-10	5-2	457	1-028	—
..	19	99-2	100-8	38	3-80	1-78	1-0271	0-00032	144-1	4-5	67	3-7	1-20	7-2	600	1-037	—
..	20	99-4	100-8	35	4-30	1-70	1-0269	0-00032	146-6	8	72	3-8	1-20	6-8	606	1-036	—
..	21	98-8	100-4	37	3-90	1-70	1-0271	0-00032	146-3	12	72	2-0	1-15	7-2	632	1-042	—
..	22	98-8	102-0	37	4-10	1-80	1-0270	0-00032	144-8	11-5	72	3-1	1-15	6-8	609	1-039	—
..	23	99-0	101-0	36	4-20	1-80	1-0271	0-00032	146-5	14	72	3-2	1-20	8-6	754	1-042	—

Pulse 44.
48.
56.
40.
48.
50.
56.
60.
48.
48.

Slight dikkop.
Dikkop disap.

HORSE 2915.

Date.	TEMPERATURE.		BLOOD.				SERUM.		
	Morning.	Evening.	Volume of Blood Corpuscles.	Specific Gravity at 98° F.	Viscosity at 77° F.	Surface Tension at 98° F.	Specific Gravity at 98° F.	Viscosity at 77° F.	Surface Tension at 98° F.
Feb. 9	—	—	48	1·0603	6·00	4·83	1·0282	1·95	5·68
.. 10	—	—	50	1·0616	5·58	5·18	1·0287	1·98	5·77
.. 11	—	—	47	1·0644	6·60	4·88	1·0300	2·10	5·17
.. 12	98·6	101·0	48	1·0633	5·72	5·17	1·0301	2·08	5·22
.. 13	99·0	101·0	47	1·0622	5·95	5·17	1·0297	2·11	5·52
.. 14	99·4	101·6	45	1·0625	5·70	4·09	1·0295	2·06	5·62
.. 15	99·0	99·8	45	1·0626	5·80	3·98	1·0295	2·07	5·59
.. 16	98·6	100·0	46	1·0631	6·45	4·44	1·0295	2·10	5·24
.. 17	98·0	100·6	46	1·0641	6·55	5·23	1·0304	2·10	—
.. 18	100·0	101·0	47	1·0620	—	4·93	1·0293	2·10	5·03
.. 19	99·0	100·8	45	1·0603	5·56	4·79	1·0287	1·90	5·30
.. 20	98·0	101·0	46	1·0610	5·60	5·20	1·0292	2·00	4·74
.. 21	99·0	100·4	47	1·0596	5·60	4·56	1·0282	1·82	4·67
.. 22	99·6	101·2	43	1·0586	5·54	4·88	1·0276	1·79	4·22
.. 23	99·8	100·8	44	1·0599	5·70	3·71	1·0283	1·92	4·33
.. 24	100·2	100·6	44	1·0599	5·20	4·78	1·0284	1·78	4·92
.. 25	100·0	102·0	43	1·0588	4·94	5·13	1·0282	1·98	4·12
.. 26	100·8	101·0	45	1·0612	6·35	5·04	1·0294	2·07	4·33
.. 27	100·0	102·0	46	1·0621	5·95	4·04	1·0297	2·01	3·96
.. 28	102·0	103·6	44	1·0595	5·54	4·96	1·0294	1·95	4·12
.. 29	102·0	105·6	41	1·0577	5·36	4·27	1·0287	2·02	4·52
Mar. 1	104·0	105·8	44	1·0575	5·71	3·71?	1·0284	2·09	4·61
.. 2	104·0	105·0	40	1·0552	4·67	4·77	1·0260	1·94	4·18
.. 3	103·0	103·8	49	1·0595	5·86	4·83	1·0270	1·95	3·83
.. 4	100·8	101·8	52	1·0608	5·76	4·44	1·0238	1·84	4·13
.. 5	99·8	100·6	53	1·0637	6·10	5·16	1·0237	1·89	5·02
.. 6	98·4	100·0	54	1·0627	6·50	5·61	1·0229	1·88	3·48
.. 7	99·2	100·0	50	1·0581	5·37	3·79	1·0221	1·86	—
.. 8	100·4	99·6	42	1·0500	4·29	—	1·0221	1·80	5·31?
.. 9	101·2	103·8	33	1·0466	3·71	—	1·0232	1·90	2·42?

HORSE 2915—(continued).

Date.	SERUM—(continued).			URINE.				
	Conduc- tivity at 98·6×10 ⁻⁴ .	Alkalinity.	Colour.	Quantity.	Specific Gravity at 98·6.	Sp. Gr. at 98·6, (filtered).	Conduc- tivity at 98·6×10 ⁻⁴ .	Conduct. at 98·6×10 ⁻⁴ (filtered).
Feb. 9 ..	142·9	0·11	Light golden yellow	—	—	—	—	—
.. 10 ..	148·0	0·11	Yellow	—	—	—	—	—
.. 11 ..	147·3	0·11	..	—	—	—	—	—
.. 12 ..	145·6	0·11	Yellow—Golden yellow	—	—	—	—	—
.. 13 ..	144·6	0·10	Golden yellow	—	—	—	—	—
.. 14 ..	148·9	0·12	Yellow	—	—	—	—	—
.. 15 ..	146·1	0·11	..	—	—	—	—	—
.. 16 ..	145·9	0·11	Golden yellow	3·0	1·036	1·033	688	618
.. 17 ..	144·4	0·12	Yellow—Golden yellow	3·2	1·039	1·033	605	598
.. 18 ..	147·8	0·12	Yellow	3·1	1·042	1·037	593	590
.. 19 ..	147·5	0·12	..	2·5	1·041	1·034	502	497
.. 20 ..	146·1	0·11	Yellow—Golden yellow	3·0	1·035	1·032	538	526
.. 21 ..	145·9	0·10	Yellow	2·8	1·035	1·032	554	545
.. 22 ..	147·2	0·14	Yellow—Golden yellow	3·2	1·034	1·031	660	642
.. 23 ..	145·1	0·13	Yellow	3·3	1·039	1·037	667	651
.. 24 ..	149·5	0·13	..	5·4	1·029	1·026	637	628
.. 25 ..	147·2	0·13	..	2·1	1·029	1·027	684	678
.. 26 ..	145·4	0·10	Golden yellow	4·8	1·030	1·027	663	658
.. 27 ..	148·3	0·13	Yellow	5·0	1·033	1·031	658	650
.. 28 ..	143·8	0·12	..	3·5	1·033	1·030	560	538
.. 29 ..	141·3	0·11	..	3·3	1·031	1·029	688	682
Mar. 1 ..	140·9	0·11	Yellow—Golden yellow	3·3	1·036	1·034	677	666
.. 2 ..	142·1	0·11	Golden yellow	4·0	1·030	1·029	576	562
.. 3 ..	144·0	0·08	..	3·3	1·034	1·032	472	446
.. 4 ..	142·8	0·10	..	0	—	—	—	—
.. 5 ..	146·1	0·06?	Reddish, clear	1·4	1·035	1·033	344	340
.. 6 ..	147·4	0·05?	..	3·7	1·040	1·037	414	395
.. 7 ..	139·3	0·13	Golden yellow	0·9	1·040	1·036	435	426
.. 8 ..	137·0	?	Reddish]golden	4·6	1·034	1·032	461	453
.. 9 ..	129·3	?	Haemalyt. red	3·0	1·028	1·025	482	465

HORSE 2915—(continued.)

Date.	URINE—(continued).					DRINK-WATER.			URINE.
	Alkalinity.	(Sp. Gr. = 1) Quantity	(Sp. Gr. = 1) Quantity (filtered).	Surface Ten- sion at 98·6.	Viscosity. at 77.	10 a.m.	4 p.m.	Total.	Colour.
Feb. 9 ..	—	—	—	—	—	—	—	—	—
„ 10 ..	—	—	—	—	—	—	—	—	—
„ 11 ..	—	—	—	—	—	—	—	—	—
„ 12 ..	—	—	—	—	—	—	—	—	—
„ 13 ..	—	—	—	—	—	—	—	—	—
„ 14 ..	—	—	—	—	—	—	—	—	—
„ 15 ..	—	—	—	—	—	—	—	—	—
„ 16 ..	6·6	108	99	—	—	6	5·5	11·5	Dark yellow
„ 17 ..	6·2	125	106	—	—	10	0	10	Muddy
„ 18 ..	5·7	130	115	—	1·20	7	2	9	„
„ 19 ..	4·4	102	85	5·46	1·25	9	4	13	„
„ 20 ..	4·4	105	96	6·23	1·25	6·5	3	9·5	„
„ 21 ..	5·4	98	90	5·64	1·23	4·5	4·5	9	„
„ 22 ..	5·5	109	99	6·40	1·18	10	4·5	14·5	Normal
„ 23 ..	6·9	128	122	5·44	1·30	2	14	16	„
„ 24 ..	4·1	156	140	5·47	1·21	12	6	18	„
„ 25 ..	5·7	61	57	6·59	1·17	5	12	17	„
„ 26 ..	4·2	144	130	6·17	1·18	5	4·5	9·5	„
„ 27 ..	5·8	165	155	5·92	1·20	11·5	5	16·5	„
„ 28 ..	6·5	115	105	6·20	1·21	10	3	13	„
„ 29 ..	8·8	102	96	5·27	1·21	2·5	1·5	4	„
Mar. 1 ..	9·9	119	112	5·28	1·25	0	5·5	5·5	„
„ 2 ..	7·8	120	116	5·05	1·21	3	2	5	„
„ 3 ..	7·4	112	106	3·75	1·30	6	3	9	Dark yellow
„ 4 ..	—	—	—	—	—	4·5	3	7·5	—
„ 5 ..	5·2	49	46	4·75	1·35	3	6	9	Dark yellow
„ 6 ..	6·1	148	137	5·22	1·37	11·5	4·5	16	„
„ 7 ..	7·8?	36	32	—	1·40	10·5	4·5	15	Yellow brown
„ 8 ..	?	156	147	4·54	1·40	13	13·5	26·5	Dark greenish brown
„ 9 ..	?	84	75	4·52	1·29	2	1	3	Dark reddish brown

HORSE 2915—(continued).

Date.	URINE—(continued).	
	Colour (filtered).	CLINICAL AND MICROSCOPICAL EXAMINATIONS.
Feb. 9 ..	—	—
„ 10 ..	—	—
„ 11 ..	—	—
„ 12 ..	—	—
„ 13 ..	—	—
„ 14 ..	—	—
„ 15 ..	—	—
„ 16 ..	Brown	—
„ 17 ..	„	—
„ 18 ..	„	—
„ 19 ..	„	—
„ 20 ..	„	—
„ 21 ..	„	—
„ 22 ..	„	—
„ 23 ..	„	—
„ 24 ..	„	—
„ 25 ..	„	Infused 5,000 c.c. virus of horse 3375.
„ 26 ..	„	„ 5,000 c.c. „ „
„ 27 ..	„	—
„ 28 ..	„	—
„ 29 ..	„	Pulse 46.
Mar. 1 ..	„	„ 60.
„ 2 ..	„	„ 48.
„ 3 ..	Dark brown	„ 56. Serum obtained only by pressing out the plasma.
„ 4 ..	—	„ 48. Dikkop above left eye. Serum obtained only by pressing out the plasma.
„ 5 ..	Reddish brown	„ 48. Dikkop. Yellow gelat. infiltr. on con. membr. and injection. Serum obtained only by pressing out the plasma.
„ 6 ..	Brown	„ 52. Dikkop strong. <i>Piroplasma equi</i> rare. Serum obtained only by pressing out the plasma.
„ 7 ..	Dark reddish brown	„ 56. <i>Piroplasma equi</i> fairly frequent.
„ 8 ..	Dark greenish brown	„ 64. <i>Piroplasma equi</i> frequent. Serum obtained only by pressing out the plasma.
„ 9 ..	Dark reddish brown	„ 68. Conjunctiva yellow. <i>Piroplasma equi</i> very frequent. Serum obtained only by pressing out the plasma. Died of piroplasmosis and sequel of horse-sickness.

HORSE 2917.

Date.	TEMPERATURE.		BLOOD.		SERUM.				Drink-water.	Temperature, 9 a.m.	URINE.					CLINICAL OBSERVATIONS.
	Morning.	Evening.	Volume of Blood Corpuscles.	Viscosity at 77° F.	Viscosity at 77° F.	Specific Gravity at 98·6.	Coefficient of Expansion (71·6-98·6).	Conduc- tivity at 98·6 × 10 ⁻⁴ .			Quantity.	Viscosity at 77.	Alkalinity.	Conduc- tivity at 98·6 × 10 ⁻⁴ .	Specific Gravity at 98·6.	
Sept. 20	—	—	—	—	—	1·0262	—	146·8	—	—	—	—	—	—	—	—
„ 21	99·8	100·8	38	—	—	—	—	—	5	—	—	—	—	—	—	—
„ 22	99·6	99·6	36	—	—	1·0270	—	147·5	9·5	—	2·6	—	6·1	563	1·048	—
„ 23	99·2	100·6	36	—	—	1·0270	—	147·0	11	—	1·5	—	5·0	478	1·048	—
„ 24	99·6	101·4	33	—	—	1·0256	—	147·3	13·5	—	1·2	—	7·2	647	1·042	—
„ 25	100·2	100·6	32	—	—	1·0264	—	146·3	5·5	—	1·8	—	6·8	560	1·047	—
„ 26	99·0	101·4	32	—	—	1·0272	—	144·2	6	—	1·2	—	8·3	570	1·049	—
„ 27	99·0	102·2	32	—	—	1·0256	—	148·0	5·5	—	2·7	—	9·0	623	1·051	—
„ 28	99·6	100·6	30	—	—	—	—	—	26·5	—	—	—	—	—	—	—
„ 29	100·0	105·0	—	—	1·68	1·0260	—	149·3	—	—	2·4	—	7·2	707	1·052	—
„ 30	101·0	100·6	30	—	1·73	1·0260	—	150·0	25	—	1·0	—	5·4	628	1·047	—
Oct. 1	99·0	102·2	30	—	1·73	1·0255	—	148·0	10	—	0·6	—	5·0	585	1·038	—
„ 2	99·2	100·8	29	3·20	1·70	1·0255	—	148·2	8	—	—	—	—	—	—	—
„ 3	99·0	101·4	29	3·05	1·70	1·0264	0·00031	150·0	16	70	—	—	—	—	—	—
„ 4	100·8	100·6	29	3·10	1·68	1·0264	0·00032	149·0	7	70	—	—	9·7	738	—	—
„ 5	100·6	101·6	29	2·70	—	1·0258	0·00034	150·5	6·5	67	0·3	—	12·6	781	1·059	—
„ 6	100·2	101·6	29	—	—	1·0256	0·00032	145·1	—	61	—	—	—	—	—	—
„ 7	101·0	100·8	31	—	1·72	1·0268	0·00032	146·4	4·5	56	1·4	—	7·2	590	1·055	—
„ 8	99·0	101·2	30	3·20	1·68	1·0263	0·00032	147·9	6	61	1·7	—	5·4	588	1·046	—
																Injected subcutaneously :
																300 c.c. polyvalent serum
																186. 2 c.c. virus CD
																2884.
„ 9	100·6	101·8	29	3·15	1·84	1·0266	0·00031	144·4	6	65	1·7	—	6·1	583	1·045	—
„ 10	100·0	101·0	29	3·60	1·79	1·0264	0·00032	146·8	7	72	1·8	—	7·6	526	1·045	—
„ 11	99·6	101·2	29	3·15	1·68	1·0268	0·00032	147·0	10·5	74	1·8	—	5·0	681	1·043	—
„ 12	100·0	101·6	—	—	1·68	—	—	146·3	3	65	2·1	—	—	694	1·044	—
„ 13	99·2	101·6	27	2·90	1·73	1·0263	0·00033	149·8	9·5	67	—	—	—	—	—	—

..	14	100.4	103.4	27	3.35	1.68	1.0267	0.00032	149.8	2	67	4.2	—	4.3	733	1.034	—
..	15	101.0	103.0	27	3.70	1.70	1.0265	0.00033	149.8	5	68	4.6	1.15	5.0	777	1.035	—
..	16	103.2	104.4	27	3.35	1.60	1.0266	0.00032	149.8	6	70	3.1	1.15	6.8	846	1.039	Pulse 64.
..	17	104.0	105.6	26	3.25	1.68	1.0255	0.00032	149.7	11	74	1.4	1.32	8.6	764	1.048	.. 62.
..	18	104.4	105.4	26	2.90	1.60	1.0244	0.00032	147.5	9	76	2.2	1.25	7.2	611	1.042	.. 58.
..	19	104.0	105.0	27	3.10	1.42	1.0242	—	145.1	10	72	2.0	1.24	5.4	391	1.035	.. 58.
..	20	104.0	104.6	26	2.65	1.50	1.0226	0.00032	143.5	6	59	1.0	1.20	6.1	440	1.030	.. 54.
..	21	102.6	104.6	27	2.75	1.54	1.0220	0.00032	143.8	11.5	65	2.7	1.28	7.2	451	1.032	.. 48. Supra orbital cavity filled.
..	22	103.4	103.0	26	2.85	1.53	1.0210	0.00032	146.8	11	72	1.4	1.20	6.5	390	1.030	Dikkop.
..	23	100.8	101.2	26	2.95	1.60	1.0224	—	146.8	16	77	2.6	1.26	6.5	365	1.034	Pulse 54.
..	24	100.6	101.0	23	2.65	1.70	1.0212	—	144.4	8.5	77	2.5	1.32	3.6	268	1.034	.. 52.
..	25	99.6	102.0	22	2.40	1.43	1.0214	0.00032	147.5	5.5	70	1.7	1.32	5.0	399	1.034	.. 52.
..	26	98.4	101.2	20	2.45	1.38	1.0226	—	148.6	2.5	63	2.2	1.10	2.5	535	1.032	.. 56.
..	27	99.4	101.6	20	2.45	1.38	1.0225	0.00032	148.0	6	63	2.0	1.18	3.6	547	1.030	.. 56.
..	28	99.0	100.2	20	2.40	1.60	1.0242	0.00033	147.5	0	68	1.7	1.22	4.3	683	1.035	.. 50. Dikkop disap.
..	29	99.4	101.6	21	2.60	1.70	1.0247	0.00034	151.6	1.5	68	1.8	1.20	6.8	680	1.045	—
..	30	99.0	100.6	21	2.80	1.62	1.0248	0.00032	151.0	5.5	63	1.7	1.20	5.4	662	1.031	—
..	31	99.6	101.2	22	2.25	1.60	1.0248	0.00032	150.0	5	63	1.1	1.25	5.8	636	1.045	—
Nov.	1	99.2	101.2	21	2.45	1.64	1.0248	0.00033	149.1	3	63	2.3	1.25	5.8	741	1.043	—
..	2	98.8	100.4	23	2.60	1.68	1.0249	—	150.5	9	67	2.5	1.18	5.4	—	1.040	—
..	3	99.0	100.8	24	2.80	1.70	1.0252	0.00033	149.4	6	68	—	—	—	—	—	—
..	4	99.0	101.6	24	2.65	1.70	1.0249	0.00034	149.3	5.5	72	1.1	1.25	9.7	824	1.051	—
..	5	99.6	101.0	23	3.30	1.70	1.0250	0.00033	151.0	8	72	1.9	1.15	6.1	694	1.046	—
..	6	98.0	100.8	23	2.80	1.65	1.0250	0.00033	152.8	16.5	72	3.5	1.12	5.8	815	1.040	—
..	7	99.6	100.2	23	2.70	1.76	1.0254	0.00033	150.3	8	70	2.7	1.18	7.2	785	1.050	—
..	8	99.4	101.6	23	2.40	1.70	1.0252	—	—	6.5	70	2.0	1.25	—	—	—	—
..	9	98.4	101.8	—	3.00	1.77	1.0255	—	151.6	14	—	1.7	1.23	—	—	—	—
..	10	99.8	101.0	—	3.00	1.75	1.0255	—	—	8.5	—	0.7	1.20	7.9	811	1.040	—
..	11	99.2	103.4	27	3.30	1.72	1.0256	0.00032	142.3	7.5	72	1.6	1.30	10.4	666	1.054	—
..	12	99.4	102.2	25	3.10	1.62	1.0256	0.00033	144.4	4	74	1.9	1.40	7.2	707	1.047	—
..	13	99.4	101.0	25	3.15	1.70	1.0259	0.00032	149.6	12.5	76	—	1.15	7.2	714	—	—
..	14	100.0	100.6	26	2.90	1.86	1.0254	0.00032	148.0	14.5	72	2.5	1.25	5.4	703	1.037	—
..	15	99.4	100.6	27	2.80	1.80	1.0258	0.00033	148.4	2	67	2.0	1.20	6.1	754	1.043	—
..	16	99.0	101.2	27	3.05	1.68	1.0250	—	148.0	6	70	2.4	1.25	6.5	705	1.044	—
..	17	99.6	101.6	27	3.05	1.68	1.0264	0.00032	148.0	7	68	2.6	1.25	7.2	685	1.050	—
..	18	99.0	101.2	26	2.85	1.53	1.0245	0.00032	146.8	3	67	2.0	1.25	7.6	700	1.048	—
..	19	99.6	101.0	26	2.80	1.76	1.0256	0.00033	146.0	1.5	67	2.6	1.28	8.3	720	1.052	—
..	20	99.0	101.4	25	3.20	1.70	1.0254	0.00032	151.0	9.5	72	3.0	1.20	7.6	705	1.050	—
..	21	99.4	100.6	26	3.30	1.65	1.0252	0.00032	149.0	8.5	72	—	1.25	9.7	776	1.053	—
..	22	99.2	100.6	28	3.40	1.75	1.0260	0.00031	148.0	7.5	72	2.0	1.26	8.6	707	1.055	—
..	23	99.2	101.0	27	3.20	1.76	1.0250	0.00032	151.6	11	72	1.5	1.25	9.7	877	1.053	—

HORSE 2917.

Date.	TEMPERATURE.		BLOOD.					SERUM.					URINE.				
	Morning.	Evening.	Volume of Blood Corpuscles.	Specific Gravity at 98° F.	Viscosity at 77° F.	Surface Tension at 98° F.	Specific Gravity at 98° F.	Viscosity at 77° F.	Surface Tension at 98° F.	Conductivity at 98° F. × 10 ⁻⁴ .	Alkalinity.	Colour.	Quantity.	Specific Gravity at 98° F.	Sp. Gr. at 98° F (filtered).	Conductivity at 98° F. × 10 ⁻⁴ .	Conduct. at 98° F. × 10 ⁻⁴ (filtered).
Feb. 9	—	—	36	1·0518	3·73	5·75	1·0260	1·75	5·84	143·0	0·15	Light yellow	—	—	—	—	—
.. 10	—	—	36	1·0540	4·13	5·45	1·0269	1·90	5·56	150·8	0·13	..	—	—	—	—	—
.. 11	—	—	37	1·0556	4·10	6·53	1·0276	1·90	5·67	153·5	0·11	Yellow	—	—	—	—	—
.. 12	98·6	100·2	37	1·0549	4·08	5·27	1·0279	1·90	4·95	150·6	0·15	Light yellow	—	—	—	—	—
.. 13	98·4	100·0	36	1·0544	4·27	5·21	1·0281	1·91	5·55	145·3	0·15	Yellow	—	—	—	—	—
.. 14	99·0	100·8	37	1·0554	4·33	5·67	1·0283	1·94	4·72	149·3	0·15	..	—	—	—	—	—
.. 15	98·6	100·2	34	1·0547	4·46	5·24	1·0270	1·88	5·65	145·9	0·16	Light yellow	—	—	—	—	—
.. 16	99·0	100·0	36	1·0552	4·36	4·86	1·0273	1·86	5·55	148·0	0·14	Yellow	1·6	1·045	1·043	623	527
.. 17	98·2	100·6	34	1·0527	4·00	3·48	1·0265	1·80	5·83	146·7	0·18	Light yellow	2·4	1·049	1·042	656	632
.. 18	99·0	101·0	36	1·0535	—	4·76	1·0274	1·83	5·54	151·3	0·15	..	3·3	1·048	1·045	684	677
.. 19	98·8	101·0	35	1·0535	4·27	5·44	1·0274	1·84	4·66	150·4	0·15	Yellow	2·9	1·049	1·044	642	638
.. 20	98·0	101·4	37	1·0525	4·10	4·88	1·0265	1·80	5·28	148·3	0·16	Light yellow	2·4	1·049	1·045	467	467
.. 21	100·0	100·8	37	1·0524	3·80	4·17	1·0264	1·71	4·42	150·5	0·11	..	2·8	1·048	1·045	503	488
.. 22	100·0	100·6	34	1·0515	4·64	5·38	1·0261	1·71	5·15	149·8	0·14	..	3·3	1·044	1·042	593	587
.. 23	99·2	101·0	37	1·0524	4·00	5·50	1·0265	1·82	4·18	149·8	0·13	Yellow	2·2	1·045	1·043	582	574
.. 24	99·6	100·6	34	1·0518	3·80	4·68	1·0263	1·79	4·37	153·7	0·13	..	5·1	1·038	1·035	684	662
.. 25	100·0	100·0	35	1·0522	3·88	5·17	1·0262	1·81	4·22	149·8	0·09	Yellow—Golden yellow	5·4	1·042	1·040	635	612
.. 26	99·8	101·0	37	1·0535	4·23	5·57	1·0261	1·81	3·96	156·1	0·12	Yellow	3·6	1·032	1·031	603	586
.. 27	100·0	103·6	36	1·0532	4·23	4·82	1·0276	1·93	4·72	146·0	0·18	..	3·2	1·044	1·041	704	680
.. 28	103·6	104·2	37	1·0547	4·33	4·68	1·0281	1·92	3·92	144·4	0·14	..	3·1	1·046	1·042	634	593
.. 29	104·6	105·6	35	1·0529	4·27	3·46	1·0274	2·02	5·08	139·9	0·13	..	3·4	1·037	1·035	600	592
Mar. 1	105·2	106·8	37	1·0536	4·48	5·28	1·0277	1·94	5·12	139·1	?	Haemalyt. red, clear	3·8	1·023	1·022	323	305
.. 2	105·0	105·0	35	1·0523	4·70	4·66	1·0265	1·98	5·11	141·1	?	..	0·2	1·008	1·008	166	156
.. 3	103·6	104·8	45	1·0559	5·64	4·48	—	—	—	—	?	..	0·9	1·015	1·012	321	265

HORSE 2917—(continued).

Date.	URINE—(continued).					DRINK-WATER.			URINE.		CLINICAL AND MICROSCOPICAL EXAMINATIONS.
	Alkalinity.	(Sp. Gr.—1) × Quantity.	(Sp. Gr.—1) × Quantity (filtered).	Surface Tension at 98°6.	Viscosity at 77.	10 a.m.	4 p.m.	Total.	Colour.	Colour (filtered).	
Feb. 9	—	—	—	—	—	—	—	—	—	—	—
„ 10	—	—	—	—	—	—	—	—	—	—	—
„ 11	—	—	—	—	—	—	—	—	—	—	—
„ 12	—	—	—	—	—	—	—	—	—	—	—
„ 13	—	—	—	—	—	—	—	—	—	—	—
„ 14	—	—	—	—	—	—	—	—	—	—	—
„ 15	—	—	—	—	—	—	—	—	—	—	—
„ 16	5·5	72	69	—	—	0	12·5	12·5	Dark yellow	Brown	—
„ 17	6·0	118	101	—	—	4·5	0	4·5	Muddy	„	—
„ 18	4·4	158	148	—	1·25	5·5	4·5	10	„	„	—
„ 19	4·1	142	128	6·08	—	5	6·5	11·5	„	„	—
„ 20	3·7	118	108	6·00	1·40	2	7	9	„	„	—
„ 21	4·2	134	126	6·03	1·33	14	2	16	„	„	—
„ 22	4·2	145	139	5·80	1·27	4	8	12	Dark yellow	Dark brown	—
„ 23	4·3	99	95	6·36	1·32	4·5	4·5	9	„	„	—
„ 24	4·2	194	178	6·13	1·20	13·5	5	18·5	Normal	Brown	—
„ 25	4·3	227	216	5·66	1·26	6	0	6	Brown	Dark brown	Infused 4,000 c.c. virus of horse 3375.
„ 26	3·9	115	112	6·10	1·22	22	5	27	Dark yellow	„	„ 6,000 c.c. „ „
„ 27	5·6	141	131	6·13	1·28	0	5	5	Normal	Reddish brown	—
„ 28	5·7	142	130	5·58	1·30	12·5	2·5	15	„	„	—
„ 29	7·8	126	119	5·38	1·25	1·5	2·5	4	Dark yellow	Dark brown	Pulse 50.
Mar. 1	?	88	84	4·42	1·27	0	5	5	Very dark greenish brown	Very dark greenish brown	„ 46. Serum obtained only by pressing out the plasma.
„ 2	2·9?	2	2	4·55	1·20	5·5	4·5	10	Greenish brown	Greenish brown	„ 54. Serum obtained only by pressing out the plasma.
„ 3	4·3	14	11	5·00	1·25	11	4·5	15·5	Muddy brown	Dark brown	„ 52. Serum coagulated. Died of horse-sickness

Three other horses, 2903, 2904, and 3091, were infused on the 13th and 14th of February, 1908, each with a total of 10,000 c.c. virus 3332; 2903 showed an indistinct temperature reaction and suffered later from accidental piroplasmosis. 2904 died of horse-sickness on the fourth day after second infusion. Examinations started two days before first infusion were (besides temperature and microscopical appearance of the blood) made on the following blood and serum properties:—

Of 2903 and 2904—

- (1) Volume of red blood corpuscles.
- (2) Viscosity of the blood and serum.
- (3) Surface tension of blood and serum.
- (4) Specific gravity of blood and serum.
- (5) Conductivity of serum.
- (6) Alkalinity of serum.

Of 3091 and 3124, all mentioned under (1), and the values of serum under (2), (3), (4), and (5), and the depression of freezing point. Horse 3124 was infused the 27th February, 1908, with 2750 c.c. virus 3256.

HORSE 2903.

Date.	TEMPERATURE.		BLOOD.				SERUM.					COLOUR.	CLINICAL AND MICROSCOPICAL EXAMINATIONS.
	Morning.	Evening.	Volume of Blood Corpuscles.	Specific Gravity at 98° F.	Viscosity at 77° F.	Surface Tension at 98° F.	Specific Gravity at 98° F.	Viscosity at 77° F.	Surface Tension at 98° F.	Conductivity at 98° F. × 10 ⁻⁴ .	Alkalinity.		
Feb. 11	99·6	101·6	35	1·0538	4·05	5·59	1·0289	1·90	5·61	149·7	0·15	Light yellow	—
„ 12	99·6	101·2	36	1·0522	3·92	4·34	1·0278	1·90	5·60	146·9	0·15	Yellow	—
„ 13	100·0	100·0	35	1·0550	4·41	5·47	1·0289	1·83	4·72	148·3	0·15	„	Infused 3,000 c.c. virus of horse 3332.
„ 14	100·0	102·0	35	1·0544	4·28	5·00	1·0289	1·95	5·21	147·9	0·15	„	Infused 7,000 c.c. virus of horse 3332.
„ 15	99·8	101·0	36	1·0579	5·36	4·12	1·0301	2·00	4·61	145·9	0·15	„	—
„ 16	100·2	102·4	36	1·0555	4·66	4·81	1·0296	1·95	5·25	145·1	0·16	„	—
„ 17	100·0	101·4	36	1·0549	4·55	4·34	1·0296	2·00	4·84	144·0	0·14	„	—
„ 18	101·6	103·0	35	1·0517	—	5·43	1·0276	1·81	5·74	146·9	0·15	Yellow—golden yellow	—
„ 19	100·2	101·0	32	1·0500	3·87	5·09	1·0278	1·83	4·60	143·8	0·10	„ Yellow	—
„ 20	98·6	101·6	31	1·0492	3·80	4·52	1·0285	2·00	3·83	147·7	0·15	„	—
„ 21	99·8	101·6	29	1·0480	3·40	5·28	1·0283	1·90	4·82	146·7	0·12	„	—
„ 22	98·6	101·0	29	1·0487	3·73	3·72	1·0287	1·93	5·02	145·3	0·12	Yellow—golden yellow	—
„ 23	100·2	100·8	31	1·0489	3·20	4·89	1·0280	1·89	4·52	145·4	0·13	Yellow	—
„ 24	99·6	101·0	32	1·0488	3·40	3·76	1·0274	1·82	5·10	146·6	0·09	Golden yellow	—
„ 25	99·0	101·8	32	1·0496	3·73	3·76	1·0279	1·91	4·87	145·8	0·13	Yellow	—
„ 26	98·6	100·8	33	1·0517	3·73	5·58	1·0284	1·96	4·25	148·3	0·12	„	—
„ 27	100·6	101·6	33	1·0498	3·43	4·39	1·0268	1·80	4·88	148·4	0·16	„	—
„ 28	99·8	101·0	32	1·0490	3·43	4·84	1·0268	1·80	5·67	148·5	0·16	„	—
„ 29	100·0	103·4	33	1·0513	3·72	4·58	1·0276	1·99	5·42	145·9	0·20	„	<i>Piroplasma equi</i> very rare.
March 1	102·0	103·6	32	1·0498	3·40	3·99	1·0271	1·94	3·90	147·2	0·11	„	—
„ 2	101·2	101·0	33	1·0496	3·74	4·74	1·0276	1·97	2·62	145·5	0·13	Light yellow—yellow	<i>Piroplasma equi</i> rare.

HORSE 2903—(continued).

Date.	TEMPERATURE.		BLOOD.				SERUM.					Colour.	CLINICAL AND MICROSCOPICAL EXAMINATIONS.
	Morning.	Evening.	Volume of Blood Corpuscles.	Specific Gravity at 98° F.	Viscosity at 77° F.	Surface Tension at 98° F.	Specific Gravity at 98° F.	Viscosity at 77° F.	Surface Tension at 98° F.	Conductivity at 98° F. × 10 ⁻⁴ .	Alkalinity.		
March 3	100·2	103·6	35	1·0507	4·08	4·72	1·0285	1·94	4·66	145·8	0·11	Yellow	Pulse 42. <i>Piroplasma equi</i> very rare. Serum obtained only by pressing out the plasma.
„ 4	102·6	104·6	34	1·0524	4·13	4·49	1·0287	2·04	5·48	146·5	0·11	Golden yellow	Serum obtained only by pressing out the plasma.
„ 5	100·6	101·8	28	1·0471	3·55	3·72	1·0270	1·88	5·62	143·5	0·10	Yellow	Pulse 64. <i>Piroplasma equi</i> very rare.
„ 6	100·4	103·2	28	1·0479	3·69	3·32	1·0275	2·00	5·32	144·5	0·10	„	Pulse 60.
„ 7	101·6	102·4	28	1·0465	3·81	5·01	1·0276	2·03	—	141·6	0·16	„	„ 52. <i>Piroplasma equi</i> very rare.
„ 8	99·0	102·0	29	1·0490	3·90	—	1·0284	1·80	5·00	144·8	0·16	„	Pulse 64.
„ 9	99·8	101·4	32	1·0505	4·22	—	1·0287	2·05	3·14?	142·4	0·22	„	„ 46.
„ 10	99·2	101·6	31	1·0501	4·03	—	1·0283	2·20	5·12	145·3	0·20	„	—
„ 11	100·0	100·8	32	1·0517	4·00	—	1·0285	2·10	4·33	145·9	0·20	„	—
„ 12	98·8	101·0	34	1·0537	4·94	2·82	1·0296	2·11	5·14	144·9	0·18	„	—
„ 13	100·0	101·0	33	1·0515	4·13	3·96	1·0285	2·05	4·38	146·7	0·20	„	—
„ 14	98·6	100·8	34	1·0513	4·13	3·49	1·0285	1·88	4·32	146·2	0·20	„	—
„ 15	99·0	100·6	34	1·0504	3·90	3·56	1·0292	1·95	4·78	147·7	0·19	„	—
„ 16	99·0	101·4	34	1·0521	4·22	—	1·0291	2·16	—	149·4	0·19	„	—
„ 17	100·0	100·8	32	1·0498	4·00	—	1·0276	2·10	5·56	147·6	0·19	„	—
„ 18	99·0	101·8	35	1·0520	4·40	5·10	1·0285	2·05	5·70	146·6	0·18	„	—
„ 19	99·0	102·4	33	1·0511	4·30	5·00	1·0281	1·90	4·54	148·8	0·17	„	—
„ 20	99·8	101·0	34	1·0509	3·80	4·54	1·0284	1·90	4·50	150·7	0·17	„	—
„ 21	99·6	100·6	37	1·0525	4·06	3·61	1·0287	1·87	5·51	151·1	0·19	„	—
„ 22	100·2	100·6	35	1·0501	3·77	3·94	1·0273	1·78	2·90	148·5	0·18	„	—

HORSE 2904.

Date.	TEMPERATURE.		BLOOD.				SERUM.					Colour.	CLINICAL AND MICROSCOPICAL EXAMINATIONS.
	Morning.	Evening.	Volume of Blood Corpuscles.	Specific Gravity at 98° F.	Viscosity at 77° F.	Surface Tension at 98° F.	Specific Gravity at 98° F.	Viscosity at 77° F.	Surface Tension at 9°-86.	Conductivity at 98° F. × 10.	Alkalinity.		
Feb. 11	100·0	101·6	37	1·0549	4·20	5·48	1·0272	1·90	5·48	150·2	0·13	Yellow	—
„ 12	99·6	101·0	35	1·0528	4·18	5·94	1·0270	1·82	5·18	148·3	0·12	„	—
„ 13	100·0	101·0	34	1·0531	4·32	5·01	1·0272	1·81	5·02	149·2	0·13	„	Infused 3,000 c.c. virus of horse 3332.
„ 14	99·2	106·0	36	1·0554	5·04	5·13	1·0275	1·98	4·92	148·7	0·14	„	Infused 7,000 c.c. virus of horse 3332.
„ 15	102·0	106·0	38	1·0580	5·11	4·28	1·0288	2·03	4·26	144·2	0·13	„	—
„ 16	105·0	105·4	33	1·0533	4·56	4·87	1·0267	1·95	5·00	145·7	0·13	„	Pulse 60. Conjunctiva injected.
„ 17	104·8	105·8	38	1·0568	5·30	4·95	1·0259	1·96	4·83	142·4	0·11	Yellow—Golden yellow	„ 60. Conjunctiva red.
„ 18.	105·0	—	65	1·0728	—	4·76	—	—	—	—	—	—	Dikkop. Died of horse-sickness.

HORSE 3091.

Date.	TEMPERATURE.		Volume of Blood Corpuscles.	SERUM.					CLINICAL AND MICROSCOPICAL EXAMINATIONS.
	Morning.	Evening.		Specific Gravity at 98·6.	Viscosity at 77° F.	Surface Tension at 98·6.	Conductivity at 98·6 × 10 ⁻⁴ .	Depression of Freezing Point C.	
Feb. 11	99·0	100·6	29	1·0271	1·78	4·75	153·9	0·6370	—
„ 12	98·6	100·8	29	1·0269	1·88	—	148·3	—	—
„ 13	99·2	100·8	28	1·0274	1·85	4·97	149·1	0·6851	Infused 3,000 c.c. virus of horse 3332.
„ 14	99·6	102·6	31	1·0285	1·94	4·74	145·6	0·6185	Infused 7,000 c.c. virus of horse 3332.
„ 15	99·6	100·6	34	1·0289	1·97	5·48	145·4	—	—
„ 16	98·2	101·0	36	1·0292	2·05 ?	5·56	144·2	—	—
„ 17	98·6	100·6	37	1·0309	2·05	5·88	147·6	0·6144	—
„ 18	99·0	100·8	37	1·0293	2·00	5·49	143·8	—	—
„ 19	98·6	100·0	34	1·0281	1·83	4·81	146·2	0·6195	—
„ 20	99·0	100·6	34	1·0282	1·98	4·67	146·6	0·5856	—
„ 21	99·2	100·6	36	1·0281	1·90	5·37	148·0	—	—
„ 22	98·6	101·0	37	1·0287	1·94	4·12	144·8	—	—
„ 23	99·0	100·6	34	1·0283	1·96	5·28	146·7	0·6360	—
„ 24	98·4	102·8	37	1·0281	1·93	3·84	146·2	—	—
„ 25	101·6	104·0	34	1·0279	1·98	3·92	142·9	—	—
„ 26	102·6	104·6	32	1·0276	1·91	5·03	144·8	0·5846	—
„ 27	103·4	104·6	33	1·0273	1·90	5·30	144·7	0·5459	—
„ 28	103·0	104·0	31	1·0279	1·92	4·87	147·4	0·5418	—
„ 29	102·0	104·4	30	1·0269	2·00	3·78	144·3	—	—
March 1	100·6	105·6	34	1·0262	2·15	3·66	142·6	—	—
„ 2	103·0	102·2	28	1·0265	1·91	3·66	142·5	0·6146	—
„ 3	101·6	103·0	29	1·0265	1·85	4·85	145·2	—	<i>Piroplasma equi</i> very rare.
„ 4	100·0	101·8	29	1·0284	1·97	4·12	148·9	0·6930	—
„ 5	98·8	101·2	29	1·0274	1·98	4·43	146·8	—	Pulse 56. <i>Piroplasma equi</i> very rare.

„ 6	98.4	100.0	27	1.0268	1.98	4.73	146.7	0.5802
„ 7	98.8	100.6	30	1.0269	1.98	—	146.6	0.6030
„ 8	100.0	100.2	30	1.0268	1.97	4.78	148.6	—
„ 9	99.6	101.0	29	1.0269	2.00	4.24 ?	148.9	0.6102
„ 10	100.0	100.6	28	1.0260	2.00	6.86 ?	150.6	0.6049
„ 11	100.6	100.0	28	1.0254	1.94	4.71	148.4	0.5674
„ 12	99.0	101.0	29	1.0268	1.94	4.97	149.9	0.5900
„ 13	99.0	100.8	29	1.0269	1.90	—	153.1	0.6018
„ 14	98.6	101.2	28	1.0260	2.03	5.23	149.5	—
„ 15	99.4	100.2	28	1.0255	1.95	3.99	150.8	—
„ 16	99.2	101.6	30	1.0266	1.95	—	151.6	0.6098
„ 17	98.4	100.2	29	1.0255	1.90	4.34	151.8	0.5968
„ 18	98.6	101.0	31	1.0269	1.98	5.54	151.3	0.6017
„ 19	98.4	101.4	31	1.0268	1.82	4.96	151.0	0.5781
„ 20	99.0	100.4	31	1.0266	1.80	5.38	151.8	0.5766
„ 21	99.6	100.0	31	1.0262	1.69	5.56	152.1	0.5915
„ 22	98.6	100.6	30	1.0265	1.71	5.11	150.2	0.5892

Piroplasma equi very rare.
Serum obtained only by pressing out the plasma.
Serum obtained only by pressing out the plasma.
Pulse 58. Serum obtained only by pressing out the plasma.

Pulse 56.

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HORSE 3124.

Date.	TEMPERATURE.		Volume of Blood Corpuscles.	SERUM.					CLINICAL OBSERVATIONS.
	Morning.	Evening.		Specific Gravity at 98·6.	Viscosity at 77° F.	Surface Tension at 98·6.	Conductivity at 98·6 × 10. ⁴ .	Depression of Freezing Point. C.	
Feb. 11	99·0	101·4	24	1·0292	2·05	5·37	147·3	0·6235	—
„ 12	99·0	100·6	24	1·0293	2·15	5·64	146·6	—	—
„ 13	99·0	100·2	26	1·0295	2·07	4·27	145·4	0·5942	—
„ 14	99·6	101·6	31	1·0284	1·95	4·51	146·6	0·6330	—
„ 15	99·6	101·4	24	1·0290	2·00	5·22	145·3	—	—
„ 16	99·0	101·2	24	1·0287	2·10 ?	4·67	145·5	—	—
„ 17	99·0	101·4	26	1·0300	2·10	5·64	145·4	0·6157	—
„ 18	100·2	100·6	27	1·0295	2·05	5·03	142·4	0·5901	—
„ 19	98·6	101·0	26	1·0284	1·98	5·37	143·5	0·5985	—
„ 20	98·0	101·6	28	1·0301	2·21	4·03	144·5	0·5933	—
„ 21	99·8	101·0	28	1·0288	2·02	2·95	144·6	0·5739	—
„ 22	98·2	101·2	27	1·0288	2·01	4·62	144·2	—	—
„ 23	99·2	101·2	27	1·0283	2·05	4·05	145·1	0·6352	—
„ 24	99·6	101·2	28	1·0288	2·06	5·19	143·6	—	—
„ 25	99·0	101·0	25	1·0288	2·08	5·02	143·4	0·5958	—
„ 26	98·6	100·6	24	1·0288	2·03	5·29	145·4	0·6111	—
„ 27	99·6	104·6	27	1·0289	2·00	4·85	145·6	0·6039	Infused 2,750 c.c. virus of horse 3256.
„ 28	103·8	104·2	27	1·0298	2·10	3·87	140·6	0·5433	—
„ 29	104·2	105·6	29	1·0283	2·01	5·22	143·9	—	—
March 1	102·0	100·6	36	1·0272	1·95	4·67	149·9	0·5587	Pulse 76. Died of horse-sickness in the night.

Results and Conclusions.

It must be distinguished between

- (a) horses which are subcutaneously injected with serum and very small quantities of virus (2915 and 2917, first time);
- (b) horses infused with great quantities of virus (3124, 2904, 2917, second time);
- (c) infused horses which in addition develop piroplasmosis (2915 second time, 3091, 2903).

Ad (a).—*The volume of blood corpuscles* decreases in both horses continually from the beginning of the examinations until the end of the temperature reaction. Then it increases in 2915 slowly without reaching the original height.

In 2917 a pronounced minimum occurs at the end of the temperature reaction, after which the values increase. That means, though horse-sickness is not a disease of the blood corpuscles the latter are affected. These results are in accordance with those mentioned under "Comparative Experiments."

The Viscosity of the Blood behaves similarly to the volume, for reasons already explained in the chapter "Viscosity." The decreases of volume of blood corpuscles and viscosity are, compared with the values in piroplasmosis, very small and occur as a rule at the end of or after the temperature reaction. (See chapter "Comparative Experiments.")

The alterations of the *viscosity of serum* start later than in piroplasmosis and recovery takes place sooner.

The *specific gravity* shows a most distinct reaction in form of a decrease after an "incubation time" of eleven and eight days respectively, and the minimum again coincides with the disappearance of the fever. This dropping of the specific gravity distinguishes itself from that taking place in piroplasmosis by its late appearance and short duration.

The *conductivity of serum* alters very little; it seems to increase first, a slight but distinct decrease emphasises itself about in the highest fever time, that is to say, coincident with the dropping of the specific gravity, not with its minimum. Also, the behaviour of *the urine* during horse-sickness attacks is different from that in piroplasmosis. Polyuria does not appear, adversely: the quantities of urine are very small in both instances.

The pathological alterations of specific gravity, viscosity, conductivity, and alkalinity of urine are very slight. Only in horse 2917 specific gravity and conductivity show distinct decreases, corresponding with the synchronical dropping of specific gravity of serum.

Résumé.—The physical-chemical alterations of blood and serum and urine due to horse-sickness infection consist of a slight decrease of the volume of erythrocytes, of viscosity of blood and serum, of conductivity of serum and (in one case) of urine. The most distinct declination shows the specific gravity of serum. The chronological order of the alterations in horse-sickness is distinct from those in piroplasmosis. In the latter disease the majority of them appear before the fever; in the former, however, the order is the following:—

- (1) Temperature reaction.
- (2) Alteration of the conductivity.

Synchronical in one instance:

- (3) Alterations of specific gravity (and viscosity) of serum.
- (4) Alterations of the volume of blood corpuscles and viscosity of blood.

It is, therefore, possible to distinguish by means of physical-chemical methods whether a horse is suffering from piroplasmosis or horse-sickness.

This task would be greatly facilitated for laboratory use by taking a physical-chemical "description" of every horse.

Ad (b).—A doubtless pure case of horse-sickness after infusion is only 3124. In such cases we would have to distinguish

- (1) among symptoms merely due to the infusion of a great quantity of homologous blood ;
- (2) among symptoms caused by the horse-sickness virus.

The symptoms under (2) are so pronounced and the duration of the attack so short that those mentioned under (1) have no chance to emphasise themselves.

The volume of blood corpuscles increases by accumulation of CO_2 in the jugular blood continually until the lethal exitus occurs caused by heart affection. (Heart form of horse-sickness.)

Specific gravity and viscosity of serum decrease on account of a loss of non-electrolytes (and perhaps colloids), as the dropping of osmotic pressure and the increase of conductivity prove.

Ad (c).—These horses show symptoms of horse-sickness and piroplasmosis together, more or less distinctly those of one or the other disease.

The slight decrease of the blood values in 2903, for instance, speaks for horse-sickness, for it follows a temperature reaction. The exacerbations of the depression of freezing point in 3091, however, are more signs of piroplasmosis. The increases of the blood values of 2915, 2917, and 2904 are caused by the horse-sickness virus, the dropping of the same, and of the conductivity of serum in 2915 is due to the influence of piroplasms. The declinations of specific gravity and surface tension of serum in 2915 are like those found in horse-sickness.

Three horses 2904, 2917, and 3124 died, evidently of horse-sickness. The physical-chemical symptoms, *which indicate the fatal end* a short time before death, are in all horses the following :—

- (1) Sudden increase of volume of corpuscles, viscosity, and specific gravity of the blood.
- (2) Sudden decrease of the specific gravity of serum.

These symptoms of death are just the reverse in horse 2915 which succumbed to piroplasmosis.

(g) PIROPLASMOSIS.

The principle of piroplasmosis is destruction of red blood cells, that is to say, haemolysis, caused by endoglobular parasites. The consequence is anaemia or, better, oligocytaemia. Therefore we have to distinguish among the clinical symptoms of a piroplasmatic infection :

Primary symptoms.

- (1) Symptoms directly due to the piroplasms (haemolysis, fever).
- (2) Symptoms due to the pathologically increased process of haemolysis, i.e. the consequences of blood destruction. (Alterations of osmotic pressure, icterus haemoglobinuria.)