

RESULTS.

Of eleven animals injected with spleen and gland pulp (medium grain) taken from heifer 561 (which was killed twenty-two days after tick infestation or nine days after the first rise of temperature), the intrathoracal injections failed to transmit the disease in all six instances: the remaining five animals were injected intrajugularly, and in two cases reactions indicative of East Coast fever were noted.

Six animals died of other causes before they could be tested, and one died of debility en route to Burnside. The other four animals were exposed to tick infestation or natural infection and one died of East Coast fever. Of the remaining three, two were still alive at the date of writing, and one died of poverty after having survived natural infection for eighty-five days.

Of the three animals which proved immune, the one that died on the 85th day of poverty had been injected intrathoracally; the second animal had been injected in the same way, but had also been used later, so that it is difficult to say which injection gave immunity. The third animal had been injected intrajugularly.

EXPERIMENT No. 5.

TO NOTE THE EFFECT OF THE INJECTION OF MATERIAL TAKEN FROM HEIFER 908.

NOTE.—Heifer No. 908 was infested on the 26th July, 1910, with brown nymphae off cattle Nos. 700, 923, and 917 (Reference Nos. 309, 268, and 335). A typical reaction set in from the 12th day, the temperature reaching the maximum of 106.4° F. on the 17th day; a remission occurred on the 23rd day, and the second half of the reaction commenced the following day, the temperature touching 104.4° F. on the 25th day, and the heifer was killed two days later (22nd August, 1911).

Theileria parva were noted in the blood from the 20th day; plasma bodies appeared for the first time in the glands on the 15th day. The examination of spleen and glands after death revealed the presence of plasma bodies.

INTRAJUGULAR INJECTIONS on the 22nd August, 1910, of 20 c.c. spleen and gland pulp (fine grain) of Heifer 908.

(A).—Cow 1023, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously on two occasions without contracting the disease, namely: On the 4th May, 1910, for an intralymphal injection of gland juice of cow 596 (Annual Report, 1909-10, p. 49), and on the 22nd July, 1910, for an intralymphal injection of gland pulp of heifer 913 [Experiment No. 2 (j)].

Treatment.—Injected as before.

Remarks.—

- (a) Temperature: An irregular reaction followed, but not typical for East Coast fever.
- (b) Microscopical examination of the blood on the 14th day showed the presence of small piroplasms. Puncture of the lymphatic glands on the 14th and 18th days gave negative results.

NOTE.—This animal was used subsequently on the 3rd January, 1911 [*vide* Experiment No. 8 (p)], for an intrajugular injection of spleen pulp of ox 179, without results.

Finally, on the 30th January, 1911, infested with brown nymphae [*vide* Experiment No. 8 (p)], contracted East Coast fever, and died on the 27th day.

(B).—*Ox* 1025, aged ; purchased in the Transvaal ; history unknown.

NOTE.—This animal had been used previously on the 17th May, 1910 (*vide* Annual Report, 1909–10, p. 48), for an intralymphal injection of gland juice of heifer 1018, without contracting East Coast fever

Treatment.—Injected as above.

Remarks.—

(a) Temperature : Irregular reaction.

(b) Microscopical examination of blood showed the presence of eosinophilia and lymphocytosis on the 14th day. Puncture of the gland and spleen on the 14th and 18th days gave negative results.

NOTE.—This animal was used subsequently on the 3rd January, 1911 [*vide* Experiment No. 8 (g)], for a subcutaneous injection of spleen pulp of ox 179, without contracting East Coast fever.

Later (30th January, 1911) was infested with ticks and reinfested on the 27th February, 1911, without developing the disease.

Finally exposed at Burnside on the 28th April, 1911, and died of poverty twenty-four days later.

(C).—*Cow* 1031, aged ; purchased in the Transvaal ; history unknown.

NOTE.—This animal had been used previously on the 4th May, 1910 (*vide* Annual Report, 1909–10, p. 47), for an intralymphal injection of gland juice of cow 596, without contracting East Coast fever.

Treatment.—Injected as above.

Remarks.—

(a) Temperature : No definite reaction was noted.

(b) Microscopical examination of the blood and gland on the 14th and 18th days gave negative results.

NOTE.—This animal was used subsequently on the 15th November, 1910 [*vide* Experiment No. 7 (g)], for an intrajugular injection of spleen pulp of heifer 1107.

On the 14th and 19th December, 1910, it was infested with brown adults [*vide* Experiment No. 7 (g)], with negative results.

Finally was exposed at Burnside on the 7th January, 1911, and was still alive on the 31st August, 1911.

(D).—*Cow* 1032, aged ; purchased in the Transvaal ; history unknown.

NOTE.—This animal had been used previously on the 4th May, 1910 (*vide* Annual Report, 1909–10, p. 47), for an intralymphal injection of gland juice of cow 596, and again on the 22nd July, 1911 [*vide* Experiment No. 2 (i)], for an intralymphal injection of gland pulp of heifer 913, without developing East Coast fever.

Treatment.—Injected as above.

Remarks.—

(a) Temperature : No definite reaction followed.

(b) Microscopical examination of the blood and glands on the 14th and 18th days gave negative results.

NOTE.—This animal was used subsequently on the 15th November, 1910 [*vide* Experiment No. 7 (f)], for an intrajugular injection of spleen pulp of heifer 1107 ; she was infested with brown ticks on the 14th December, 1909 [*vide* Experiment No. 7 (f)], contracted East Coast fever, and died on the 20th day.

(E).—*Ox* 1038, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously on two occasions without contracting the disease, namely: On the 4th May, 1910, for an intralymphal injection of gland juice of cow 596 (Annual Report, 1909–10, p. 48); and on the 22nd July, 1910, for an intralymphal injection of spleen pulp of heifer 913 [Experiment No. 2 (g)].

Treatment.—Injected as above.

Remarks.—

(a) Temperature: No definite reaction ensued.

(b) Microscopical examination of blood: Eosinophilia and leucocytosis were noted on the 14th day, but examination of gland juice on the same date gave negative results.

NOTE.—Used subsequently on the 15th November, 1910 [*vide* Experiment No. 7 (c)], for an intrajugular injection of spleen pulp of heifer 1107, with negative results.

Finally tested on the 14th December, 1910, with brown adults, developed East Coast fever, and died on the 22nd day.

(F).—*Bull* 1039, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously on two occasions without contracting the disease, namely: On the 4th May, 1910, for an intralymphal injection of gland juice of cow 596; and on the 18th July, 1910, for an intralymphal injection of spleen pulp of heifer 1011 [Experiment No. 1 (g)].

Treatment.—Injected as above.

Remarks.—

(a) Temperature: No definite reaction resulted.

(b) Microscopical examination of blood: Anisocytosis, eosinophilia, and leucocytosis were noted on the 1st day. Puncture of the glands on the 14th day gave negative results.

NOTE.—This animal was used later on the 15th November, 1910, for an intrajugular injection of spleen pulp of heifer 1107, without contracting East Coast fever [*vide* Experiment No. 7 (b)].

Was infested with ticks on the 14th December, 1910, and reinfested five days later, with negative results. Finally was exposed at Burnside on the 7th January, 1911, and died of East Coast fever on the 27th day.

(G).—*Ox* 1048, about two and a half years old; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously on two occasions without contracting the disease, namely: On the 4th May, 1910, for an intralymphal injection of gland juice of cow 596 (Annual Report, 1909–10, p. 47); and on the 22nd July, 1910, for an intralymphal injection of spleen pulp of heifer 913 [Experiment No. 2 (h)].

Treatment.—Injected as above.

Remarks.—

(a) Temperature: Irregular records followed, but nothing typical for East Coast fever.

(b) Microscopical examination of blood: Leucocytosis was noted on the 14th day, but examination of the spleen and gland on the same date gave negative results.

NOTE.—This animal was used subsequently on the 15th November, 1910 [*vide* Experiment No. 7 (a)], for an intrajugular injection of spleen pulp of heifer 1107.

Later was tested on the 14th December, 1910, with ticks, and died of East Coast fever on the 35th day.

SUMMARY OF EXPERIMENT NO. 5.

With Material from Heifer 908.

NUMBER OF DAYS WHICH ELAPSED BETWEEN INFESTATION OF ANIMAL WITH TICKS AND DEATH: 27.

NUMBER OF DAYS WHICH ELAPSED BETWEEN THE DATE OF THE FIRST RISE OF TEMPERATURE AND DEATH: 15.

DETAILS OF INJECTIONS AND RESULTS.

Ref. No.	Animal injected.	No. of times the animal was injected previously or subsequently.	References to these injections.	Method of injection.	Quantity injected.	Material injected.		Result.	REMARKS.
						Pulp of	Grain.		
A.	Cow 1023	3	A. R. 1909-10; Expts. 2 J & 8 P	Intrajugular	20 c.c.	Spleen and gland	Fine	I.R.	For final history see Experiment 8 P (R.P. † to ticks).
B	Ox 1025	2	A. R. 1909-10; Expt. 8 G	"	"	" "	"	I.R.	For final history see Experiment 8 G († poverty at Burnside 19th day.
C.	Cow 1031	2	A.R. 1909-10; Expt. 7 G	"	"	" "	"	N.R.	For final history see Experiment 7 G (still alive at Burnside).
D.	Cow 1032	3	A. R. 1909-10; Expts. 2 I & 7 F	"	"	" "	"	N.R.	For final history see Experiment 7 F (R.P. † to ticks).
E.	Ox 1038	3	A. R. 1909-10; Expts. 2 G & 7 C	"	"	" "	"	N.R.	For final history see Experiment 7 C (R.P. † to ticks).
F.	Bull 1039	3	A. R. 1909-10; Expts. 1 G & 7 B	"	"	" "	"	N.R.	For final history see Experiment 7 B (R.P. † at Burnside).
G.	Ox 1048	3	A. R. 1909-10; Expts. 2 H & 7 A	"	"	" "	"	I.R.	For final history see Experiment 7 A (R.P. † to ticks).

EXPLANATION OF SYMBOLS.

R.P. †.—Indicates that the animal had a reaction, accompanied with the presence of plasma bodies, and died of East Coast fever.

I.R.—Indicates that the animal had an irregular reaction and recovered.
N.R.—Indicates that the animal did not react to the injection.

RESULTS.

Of seven animals injected intrajugularly with 20 c.c. spleen and gland pulp (fine grain) of heifer 908 (which was killed twenty-seven days after tick infestation or fifteen days after the first rise of temperature), none contracted the disease. All these five animals were used in previous and later experiments, the final history being that five contracted East Coast fever when exposed to natural infection, one died of poverty on the 19th day after exposure, and one was still alive at the date of writing.

EXPERIMENT No. 6.

TO NOTE THE EFFECT OF THE INJECTION OF MATERIAL FROM HEIFER 1053.

NOTE.—*Heifer* 1053, a Cape Province animal, about three years old.

Treatment.—Infested on the 25th September, 1910, with twelve brown adults off certain cattle in Natal, which at that time were suffering from East Coast fever (Reference No. 349).

Remarks.—The temperature rose on the 19th day, reaching 105·8° F. two days later, and 106° F. on the 24th day; twenty-four hours later it had dropped to 105·6° F., and a remission set in, falling to 102° F. the following day; a second ascent was noticed, reaching a maximum of 105° F. on the 26th day, and the animal was killed the following day.

Examination of the lymphatic glands proved the presence of agamogonous forms in rare numbers on the 22nd day; on the same date agamonts were noted in the blood. *Theileria parva* were frequently met with in the blood on the 20th and 26th days. Examination of the glands and spleen on *post-mortem* examination proved the presence of plasma bodies in great numbers.

NOTE.—This animal was killed three days after the remission and before the second rise had reached its maximum.

(a) INTRATHORACAL INJECTIONS on the 25th October, 1910, with 20 grammes spleen pulp (coarse grain) of *Heifer* 1053.

(A).—*Heifer* 1056, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in May, 1910.

Treatment.—Injected as above.

Remarks.—

(a) Temperature: Immediate reaction followed, reaching 105° F. as a maximum and descending to normal on the 14th day; another short reaction commenced the following day with a maximum of 104° F. and regaining normal on the 20th day; a third reaction set in on the 25th day and lasting until the 35th day.

(b) Microscopical examination of blood: Anisocytosis was noted on the 6th day.

Immunity Tests.—Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [*Note*.—See Experiment No. 25 (d); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—All ticks were dead the following day. No reaction followed. The heifer was killed on the 6th day on account of poverty.

(B).—*Heifer* 1057, about three years old, a Cape Province animal, which arrived at the Laboratory in May, 1910.

Treatment.—Injected as above.

Remarks.—

- (a) Temperature: A sharp rise to 105° F. was noted the following day, after which time the temperature gradually descended to 101·4° F. on the 8th day; a curve was noted between the 9th to 20th days, and the average temperature from the 13th to 19th days was 104° F.; on one occasion 105·8° F. was recorded.
- (b) Microscopical examinations of blood: All negative. Puncture of the lymphatic glands on the 15th and 19th days also gave negative results.

Immunity Tests.—

- (1) Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [*Note.*—See Experiment No. 25 (d); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—One tick was fast the following day; no reaction followed.

- (2) Infested on the 8th December, 1910, with six brown adults off heifer 1053 (Reference No. 411). (*Note.*—See above.)

Remarks.—Four ticks were fast the following day. No reaction followed.

- (3) Infested on the 14th December, 1910, with two brown nymphae off heifer 1082 (Reference No. 430), and two off heifer 1107 (Reference No. 435). [*Note.*—See Experiment No. 25 (j); these ticks were not infective.]

Remarks.—Two ticks were fast the following day. A slight irregular reaction followed.

- (4) Exposed on the farm Burnside on the 7th January, 1911, and died on the 7th March, 1911 (59th day), of septicaemia. The lesions of an anaemia were noted in the blood. Examination of the glands gave negative results; putrefactive bacteria were noted in the spleen.

(C).—*Cow* 1029, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously without contracting the disease, namely: On the 4th May, 1910, for an intralymphal injection of gland juice of cow 596 (*vide* Annual Report, 1909–10, p. 47).

Treatment.—Injected as above.

Remarks.—Temperature: A slight reaction followed, with a maximum of 103·4° F. The cow died on the 10th day of gangrenous pneumonia.

(D).—*Heifer* 1060, about two and a half years old; a Cape Province animal, which arrived at the Laboratory in May, 1910.

Treatment.—Injected as above.

Remarks.—

- (a) Temperature: An irregular reaction followed, with a maximum evening record of 103° F. From the 12th day onwards a definite reaction set in gradually rising to a maximum of 105° F. on the 21st day, and returning to normal three days later.

- (b) Microscopical examination of blood: Negative. Puncture of the lymphatic glands on the 19th and 23rd days also gave negative results.

Immunity Tests.—

- (1) Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [*Note.*—See Experiment No. 25 (d); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—All ticks were dead the following day. No reaction followed.

- (2) Infested on the 8th December, 1910, with six brown adults off heifer 1053 (Reference No. 411). (*Note.*—See above.)

Remarks.—Five ticks were fast the following day. No reaction followed.

- (3) Infested on the 14th December, 1910, with two brown nymphae off heifer 1082 (Reference No. 430), and two off heifer 1107 (Reference No. 435). [*Note.*—See Experiment No. 25 (j); these ticks were not infective.]

- (4) Exposed on the farm Burnside on the 7th January, 1911, and died on the 21st day of East Coast fever. Examination of the spleen and glands showed the presence of plasma bodies.

- (b) INTRATHORACAL INJECTIONS on the 27th October, 1910, with 15 grammes spleen pulp (lumps) of Heifer 1053.

- (E).—Cow 1034, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously without contracting the disease, namely, on the 4th May, 1910, for an intracutaneous injection of gland juice of cow 596 (*vide* Annual Report, 1909–10, p. 49).

Treatment.—Injected as above.

Remarks.—Temperature: Irregular records (averaging 102° F. in the morning, and one degree higher in the evening) were noted up to the 23rd day.

Immunity Tests.—

- (1) Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [*Note.*—See Experiment No. 25 (d); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—Four ticks were fast the following day. No reaction followed.

- (2) Infested on the 8th December, 1910, with six brown adults off heifer 1053 (Reference No. 411). (*Note.*—See above.)

Remarks.—Five ticks were fast the following day. No reaction followed.

- (3) Infested on the 14th December, 1910, with two brown adults off heifer 1053 (Reference No. 411), and two adults off heifer 1111 (Reference No. 426). [*Note.*—See Experiment No. 25 (d) and 25 (i); both batches of ticks were infective.]

Remarks.—Two ticks were fast the following day. No reaction followed.

- (4) Exposed on the farm Burnside on the 7th January, 1911, and was still alive on the 31st August, 1911.

(F).—*Heifer* 1019, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in March, 1910.

Treatment.—Injected as above.

Remarks.—Temperature: Immediate reaction followed for the first few days. Second reaction noted from the 12th to 24th days, with occasional exacerbations above 103° F., but as an average remaining below 102° F.

Immunity Tests.—

(1) Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [*Note.*—See Experiment No. 25 (*d*); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—Five ticks were fast the following day.

(2) Infested on the 8th December, 1910, with six brown adults off heifer 1053 (Reference No. 411). (*Note.*—See above.)

Remarks.—Four ticks were fast the following day.

(3) Infested on the 14th December, 1910, with two brown adults off heifer 1053 (Reference No. 411), and two off heifer 1111 (Reference No. 426). [*Note.*—See Experiment No. 25 (*d*) and 25 (*i*); both batches of ticks were infective.]

Remarks.—Two ticks were fast the following day. A temperature reaction followed from the 13th day after the first infestation, lasting for eleven days, with a maximum of 104° F. on the 16th day. *Theileria parva* appeared in the blood for the first time on the 18th day; plasma bodies (agamogonous forms) were noted in the glands on the 20th day after the first infestation.

(4) Exposed on the farm Burnside on the 7th January, 1911. A reaction followed soon after exposure, and the heifer died on the 30th day of East Coast fever. The examination of the gland smears revealed the presence of plasma bodies in rare numbers.

(G).—*Heifer* 1081, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in May, 1910.

Treatment.—Injected as above.

Remarks.—

(a) Temperature: An immediate rise occurred to 105° F. on the 1st day, descending to normal on the 6th day. A reaction set in on the 9th day, lasting for nine days, with an average evening temperature of 103° F.

(b) Microscopical examination of blood: *Babesia bigemina* was noted on the 10th day. Puncture of the lymphatic glands on the 15th day gave negative results.

Immunity Tests.—

(1) Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [*Note.*—See Experiment No. 25 (*d*); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—No ticks were found the following day. No reaction followed.

(2) Infested on the 8th December, 1910, with six brown adults off heifer 1053 (Reference No. 411). (*Note.*—See above).

Remarks.—Four ticks were fast the following day. No reaction followed.

(3) Infested on the 14th December, 1910, with two brown nymphae off heifer 1082 (Reference No. 430), and two adults off heifer 1107 (Reference No. 435). [*Note.*—See Experiment No. 25 (*j*); these ticks were not infective.]

Remarks.—One tick was fast the following day. No reaction followed.

(4) Exposed on the farm Burnside on the 7th January, 1911, and died on the 34th day of septicaemia. Anisocytosis, poikilocytosis, and bacteria were noted in the blood, but the examination of the spleen and glands gave negative results.

(H).—Ox 1027, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously without contracting the disease, on the 17th May, 1910, for an intralymphal injection of gland juice of heifer 1018 (*vide* Annual Report, 1909–10, p. 48).

Treatment.—Injected as above.

Remarks.—Temperature: No definite reaction followed.

Immunity Tests.—Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [*Note.*—See Experiment No. 25 (*d*); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—Four ticks were fast the following day. The temperature rose on the 14th day and a reaction ensued, the animal dying on the 35th day of East Coast fever. *Theileria parva* were noted in the blood on the 31st day, and two days later plasma bodies were found in the glands.

(c) INTRALYMPHAL INJECTIONS on the 27th October, 1910, with 20 grammes spleen pulp (*fine grain*) of Heifer 1053.

(I).—Cow 1064, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously, contracting the disease, namely, on the 3rd June, 1910, for an intralymphal injection of gland juice of heifer 897 (*vide* Annual Report, 1909–10, p. 48).

Treatment.—Injected as above.

Remarks.—No temperature reaction followed.

NOTE.—This animal was used later on the 3rd January, 1911 [*vide* Experiment No. 8 (*q*)], for an intrajugular injection of spleen pulp of ox 179, and was killed five days later on account of anaemia.

(d) INTRAJUGULAR INJECTIONS on the 27th October, 1910, with 20 grammes spleen pulp (*coarse grain*) of Heifer 1053.

(J).—Cow 1035, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously without contracting the disease, namely, on the 25th April, 1910, for an intrajugular injection of gland juice of heifer 928 (*vide* Annual Report, 1909–10, p. 49).

Treatment.—Injected as above.

Remarks.—A temperature reaction followed from about the 10th day, continuing somewhat irregularly until the 23rd day.

Immunity Tests.—

- (1) Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [*Note.*—See Experiment No. 25 (*d*); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—No ticks were found the following day.

- (2) Infested on the 8th December, 1910, with six brown adults off heifer 1053 (Reference No. 411). (*Note.*—See above.)

Remarks.—All ticks were fast the following day. A reaction commenced about the 19th day, lasting until the 32nd day.

- (3) Exposed on the farm Burnside on the 7th January, 1911, and was still alive on the 31st August, 1911.

(*K*).—*Heifer* 1058, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in May, 1910.

Treatment.—Injected as above.

Remarks.—

- (*a*) Temperature: Reaction commenced two days later with a maximum rise to 103·8° F. on the 5th day, returning to normal three days later. A second reaction set in on the 12th day, lasting until the 24th day, with one evening record of 105° F.
- (*b*) Microscopical examination of blood: Negative. Puncture of the lymphatic glands on the 15th and 19th days also gave negative results.

Immunity Tests.—

- (1) Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [*Note.*—See Experiment No. 25 (*d*); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—No ticks were found the following day. No reaction followed.

- (2) Infested on the 8th December, 1910, with six brown adults off heifer 1053 (Reference No. 411). (*Note.*—See above.)

Remarks.—Five ticks were fast the following day. No reaction followed.

- (3) Infested on the 14th December, 1910, with two brown nymphae off heifer 1082 (Reference No. 430), and two adults off heifer 1107 (Reference No. 435). [*Note.*—See Experiment No. 25 (*j*); these ticks were not infective.]

Remarks.—Four ticks were fast the following day. No reaction followed.

- (4) Exposed on the farm Burnside on the 7th January, 1911, and died on the 19th day of East Coast fever, when plasma bodies were found in the blood, spleen, and glands.

(*L*).—*Heifer* 1055, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in June, 1910.

Treatment.—Injected as above.

Remarks.—A temperature reaction followed from the 9th to 17th days, with a maximum record of 103° F. on the 15th day.

Immunity Tests.—

- (1) Infested on the 2nd December, 1910, with brown adults off heifer 1053 (Reference No. 411). [*Note.*—See Experiment No. 25 (*d*); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—Two ticks were fast the following day. No reaction followed.

- (2) Infested on the 8th December, 1910, with brown adults off heifer 1053 (as above).

Remarks.—Five ticks were fast the following day. No reaction followed.

- (3) Infested on the 14th December, 1910, with two brown nymphae off heifer 1082 (Reference No. 430), and two off heifer 1107 (Reference No. 435). [*Note.*—See Experiment No. 25 (*j*); these ticks were not infective.]

Remarks.—Four ticks were fast the following day. No reaction followed.

- (4) Exposed on the farm Burnside on the 7th January, 1911, and died on the 26th day of East Coast fever. Microscopical examination of the blood and glands gave negative results, but plasma bodies in very rare numbers were detected in the spleen.

(*M*).—Heifer 1113, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in August, 1910.

Treatment.—Injected as above.

Remarks.—

- (*a*) Temperature: A slight reaction followed for the first few days, developing into a distinct reaction from the 14th to 21st days, with a maximum evening temperature of 105° F. on two occasions.
- (*b*) Microscopical examination of blood: Negative. Puncture of the lymphatic glands on the 19th day also gave negative results.

Immunity Tests.—

- (1) Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [*Note.*—See Experiment No. 25 (*d*); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—One tick was fast the following day; no reaction followed.

- (2) Infested on the 8th December, 1910, with six brown adults off heifer 1053 (Reference No. 411). (*Note.*—See above).

Remarks.—Six ticks were fast the following day. No reaction followed.

- (3) Infested on the 14th December, 1910, with two brown nymphae off heifer 1082 (Reference No. 430), and two off heifer 1107 (Reference No. 435). [*Note.*—See Experiment No. 25 (*j*); these ticks were not infective.]

Remarks.—Four ticks were fast the following day. No reaction followed.

- (4) Exposed on farm Burnside on the 7th January, 1911, and died on the 20th day of East Coast fever; plasma bodies were found in the glands and spleen at *post-mortem* examinations.

(N).—Cow 607, about three and a half years old; an Africander animal.

Treatment.—Injected as above.

Remarks.—Temperature: Reaction from the 10th day with exacerbations on the 17th day to 102·8° F., and returning to normal two days later.

Immunity Tests.—

(1) Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [*Note.*—See Experiment No 25 (d); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—Four ticks were fast the following day. No reaction followed.

(2) Infested on the 8th December, 1910, with six brown adults off heifer 1053 (as above).

Remarks.—Five ticks were fast the following day; no reaction followed.

(3) Infested on the 14th December, 1910, with two brown adults off heifer 1053 (see above), and two off heifer 1111 (Reference No. 426). [*Note.*—See Experiment No. 25 (d) and 25 (i); both batches of ticks were infective.]

Remarks.—Two ticks were fast the following day. No reaction followed.

(4) Exposed on the farm Burnside, on the 7th January, 1911, and was still alive on the 31st August, 1911.

(e) INTRAJUGULAR INJECTIONS on the 27th October, 1910, with 15 grammes spleen pulp (coarse grain) of Heifer 1053.

(O).—Heifer 1089, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in June, 1910.

Treatment.—Injected as above.

Remarks.—

(a) Temperature: A slight irregular reaction was noted for the first fourteen days, developing into a definite reaction with a maximum temperature of 105° F. The animal died on the 22nd day of East Coast fever.

(b) Microscopical examination of blood: Negative. Puncture of the lymphatic glands on the 19th and 21st days gave negative results. Examination of the gland and spleen at *post-mortem* examination showed the presence of rare agamonts.

(f) INTRASPLENIC INJECTIONS on the 27th October, 1910, with 20 grammes spleen pulp (fine grain) of Heifer 1053.

(P).—Bull 1045, about three years old; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously on the 18th July, 1910, for an intralymphal injection of gland pulp of cow 1011 [*vide* Experiment No. 1 (j)], without contracting East Coast fever.

Treatment.—Injected as above.

Remarks.—

(a) Temperature: No definite reaction ensued.

(b) Microscopical examination of blood: Negative. Puncture of the lymphatic glands on the 15th day also gave negative results.

NOTE.—This animal was used later on the 3rd January, 1911 [*vide* Experiment No. 8 (v)] for an intrathoracal injection of spleen pulp of ox 179, and died on 15th day of toxæmia.

(g) *Grafting of Supramammary Gland of Heifer 1053 to the Right Prescapular Lymphatic Gland of Ox 1037.*

(Q).—Ox 1037, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been previously used on two occasions without contracting the disease, namely: On the 25th May, 1910, for an intralymphal injection of gland juice of heifer 928 (*vide* Annual Report, 1909–10, p. 48); and on the 18th July, 1910, for an intralymphal injection of spleen pulp of cow 1011 [*vide* Experiment No. 1 (h).]

Treatment.—As above.

Remarks.—

(a) Temperature: Irregular reaction, but nothing definite.

(b) Microscopical examination of blood: Small piroplasms noted on the 9th and 11th day.

NOTE.—This animal was used later on the 3rd January, 1911 [*vide* Experiment No. 8 (u)] for an intrathoracal injection of spleen pulp of ox 179.

Later was infected with brown nymphæ [*vide* Experiment No. 8 (u)], contracted East Coast fever, and died on the 23rd day.

(h) *INTRAPERITONEAL INJECTIONS on the 27th October, 1910, with 20 grammes spleen pulp (coarse grain) of Heifer 1053.*

(R).—Heifer 1085, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in May, 1910.

Treatment.—Injected as above.

Remarks.—Temperature: A reaction commenced almost immediately, reaching 104° F. on the 4th day and returning to normal three days later. The temperature remained somewhat above normal until the 20th day, when the heifer was killed on account of poverty.

(i) *INTRAPERITONEAL INJECTIONS on the 22nd October, 1910, with 15 grammes spleen pulp (lumps) of Heifer 1053.*

(S).—Heifer 1087, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in June, 1910.

Treatment.—As above.

Remarks.—No temperature reaction.

NOTE.—This animal was used later on the 3rd January, 1911 [*vide* Experiment No. 8 (x)] for an intrathoracal injection of spleen pulp of ox 179.

Was infested on the 30th January, 1911, with brown nymphæ; was reinfested twenty-eight days after; finally was exposed at Burnside on the 28th April, 1911, and died of poverty on the 2nd June.

(j) SUBCUTANEOUS INJECTIONS on the 25th October, 1910, with 15 grammes spleen pulp (coarse grain) of Heifer 1053.

(T).—Heifer 1010, about three years old, a Cape Province animal, which arrived at the Laboratory in May, 1910.

Treatment.—Injected as above.

Remarks.—

(a) Temperature: An immediate reaction followed, with a maximum temperature of 103.4° F.; a second reaction ensued between the 16th and 22nd days, with an exacerbation to 105° F. on the 18th day.

(b) Microscopical examination of blood: Negative. Puncture of the lymphatic glands on the 19th and 21st days also gave negative results.

Immunity Tests.—

(1) Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [*Note.*—See Experiment No. 25 (d); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—One tick was fast the following day. No reaction followed.

(2) Infested on the 8th December, 1910, with six brown adults off heifer 1053 (as above).

Remarks.—Five ticks were fast the following day. No reaction followed.

(3) Infested on the 14th December, 1910, with two brown adults off heifer 1053 (as above), and two adults off heifer 1111 (Reference No. 426).

[*Note.*—See Experiment No. 25 (i); both batches ticks were infective.]

Remarks.—Three ticks were fast the following day. An irregular reaction followed, but in no way typical.

(4) Exposed on the farm Burnside on the 7th January, 1911, and died on the 10th day, the cause of death being attributed to tick irritation. Microscopical examination of the glands and spleen gave negative results.

(U).—Heifer 1022, about three years old, a Cape Province animal, which arrived at the Laboratory in March, 1910.

Treatment.—Injected as above.

Remarks.—

(a) Temperature: A sharp reaction ensued for about three days, followed by some irregular records lasting about a fortnight.

(b) Microscopical examination of blood: Negative.

Immunity Tests.—

(1) Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [*Note.*—See Experiment No. 25 (d); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—No ticks were found the following day.

(2) Infested on the 8th December, 1910, with six brown adults off heifer 1053 (as above).

Remarks.—Three ticks were fast the following day. No reaction followed.

- (3) Infested on the 14th December, 1910, with two brown adults off heifer 1053 (see above), and two adults off heifer 1111 (Reference No. 426). [Note.—See Experiment No. 25 (i); both batches of ticks were infective.]

Remarks.—One tick was fast the following day. Some irregular oscillations were noted, but in no way typical for East Coast fever.

- (4) Exposed on the farm Burnside on the 7th January, 1911, and died on the 30th day of tick irritation. Examination of the blood showed anisocytosis and spirochaetes, the latter also being noted in the glands; the spleen gave negative results.

- (k) SUBCUTANEOUS INJECTIONS on the 27th October, 1910, with 15 grammes spleen pulp (lumps) of Heifer 1053.

- (V).—Heifer 1114, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in August, 1910.

Treatment.—Injected as above.

Remarks.—A slight temperature reaction followed reaching 103° F. and returning to normal on the 6th day. Another reaction followed from the 11th day, but not characteristic.

Immunity Tests.—

- (1) Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [Note.—See Experiment No. 25 (d); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—All ticks were dead the following day.

- (2) Infested on the 8th December, 1910, with brown adults off heifer 1053 (see above).

Remarks.—Four ticks were fast the following day.

- (3) Infested on the 14th December, 1910, with two brown nymphae off heifer 1082 (Reference No. 430), and two nymphae off heifer 1107 (Reference No. 435). [Note.—See Experiment No. 25 (i); these ticks were not infective.]

Remarks.—A reaction followed eleven days after the second infestation, reaching 105° F. on the 14th day and 105·4° F. on the 18th day. The animal died of East Coast fever on the 26th day. Plasma granules were found in the lymphatic glands on the 14th day, and in both spleen and glands at *post-mortem* examination.

- (W).—Heifer 1059, about two and a half years old, a Cape province animal, which arrived at the Laboratory in June, 1910.

Treatment.—Injected as above.

Remarks.—

- (a) Temperature: Immediate reaction to 105·6° F. on the first day and returning to normal on the 10th day; a second reaction commenced two days later, reaching 106° F. on the 15th day; a remission occurred on the 21st day, and the temperature fell within physiological limits on the 31st day; this temperature curve resembled that of East Coast fever.

- (b) Microscopical examination of blood: Negative. Puncture of the lymphatic glands on the 15th, 19th, and 23rd days also gave negative results.

Immunity Tests.—

- (1) Infested on the 2nd December, 1910, with six brown adults off heifer 1053 (Reference No. 411). [*Note.*—See Experiment No. 25 (d); heifer 1157 contracted East Coast fever from the infestation of six ticks of the same batch.]

Remarks.—No ticks were found the following day. No reaction followed.

- (2) Infested on the 8th December, 1910, with six brown adults off heifer 1053 (as above).

Remarks.—Six ticks were fast the following day. No reaction followed.

- (3) Infested on the 14th December, 1910, with two brown nymphae off heifer 1082 (Reference No. 430), and two off heifer 1107 (Reference No. 435). [*Note.*—See Experiment No. 25 (j); these ticks were not infective.]

Remarks.—Four ticks were fast the following day. No reaction followed.

- (4) Exposed on the farm Burnside, and died on the 19th day of East Coast fever complicated with redwater. The examination of the blood showed the presence of *Theileria parva* and *Babesia bigemina*, whilst plasma bodies were noted in the spleen and glands.

EXPERIMENT No. 6.

With Material from Heifer 1053.

NUMBER OF DAYS WHICH ELAPSED BETWEEN INFESTATION OF ANIMAL WITH TICKS AND DEATH: 27.

NUMBER OF DAYS WHICH ELAPSED BETWEEN THE DATE OF THE FIRST RISE OF TEMPERATURE AND DEATH: 8.

(No bacteria were found in the smears taken immediately after death.)

DETAILS OF INJECTIONS AND RESULTS.								DETAILS OF TESTS ON IMMUNITY.				REMARKS.	
Ref. No.	Animal injected.	No. of times the animal was injected previously or subsequently.	References to these injections.	Method of injection.	Quantity injected.	Material injected.		Result.	No. of times tested with ticks.	Result.			Result of exposure at Burnside.
						Pulp of	Grain.			No. of tick infestation.			
A.	Heifer 1056	—	—	Intrathoracal	20 grs.	Spleen	Coarse	I.R. † O.C.	—	—	—	—	Killed on account of poverty 36th day. Death due to septicaemia.
C.	Heifer 1057 Cow 1029	1	A. R. 1909-10	"	"	"	"	R.R. † G.P. 10th day	3	3	I.R.	† O.C. 59th day.	
D.	Heifer 1060	—	—	"	"	"	"	R.R.	3	—	N.R.	R.P. †.	Plasma bodies noted after infestation of ticks, and again after exposure at Burnside. Death due to septicaemia.
E.	Cow 1034	1	A. R. 1909-10	"	15 grs.	"	Lumps	I.R.	3	—	N.R.	Still alive (236 days)	
F.	Heifer 1019	—	—	"	"	"	"	R.R.	3	1, 2, & 3	R.P.R.	R.P. †.	
G.	Heifer 1081	—	—	"	"	"	"	I.R.	3	—	N.R.	† O.C. 34th day.	For final history see Experiment 8 q (killed on account of anaemia).
H.	Ox 1027	1	A. R. 1909-10	"	"	"	"	N.R.	1	1	R.P. †	—	
I.	Cow 1064	2	A. R. 1909-10; Expt. 8 q	Intralympthal	20 grs.	"	Fine	N.R.	—	—	—	—	
J.	Cow 1035	1	A. R. 1909-10	Intrajugular	"	"	Coarse	I.R.	2	2	R.R.	Still alive (236 days)	For final history see Experiment 8 v (died of toxæmia).
K.	Heifer 1058	—	—	"	"	"	"	R.R.	3	—	N.R.	R.P. †.	
L.	Heifer 1055	—	—	"	"	"	"	I.R.	3	—	N.R.	R.P. †.	
M.	Heifer 1113	—	—	"	"	"	"	R.R.	3	—	N.R.	R.P. †.	Still alive (236 days)
N.	Cow 607	—	—	"	"	"	"	I.R.	3	—	N.R.	R.P. †.	
O.	Heifer 1089	—	—	"	15 grs.	"	"	R.P. †	—	—	—	—	
P.	Bull 1045	2	Expts. 1 I & 8 v	Intrasplenic	20 grs.	"	Fine	N.R.	—	—	—	—	For final history see Experiment 8 v (died of toxæmia).
Q.	Ox 1037	3	A. R. 1909-10; Expts. 1 h & 8 ũ	Grafting	—	Supramammary gland	—	I.R.	—	—	—	—	For final history see Experiment 8 v (R.P. † to ticks).

R.	Heifer 1085	—	—	Intraperitoneal	20 grs.	Spleen	Coarse	I.R. †	—	—	—	—	Killed on account of poverty on 20th day. For final history see Experiment 8 X († O.C. at Burnside).
S.	Heifer 1087	1	Expt. 8 X	„	15 grs.	„	Lumps	Poverty] N.R.	—	—	—	—	
T.	Heifer 1010	—	—	Subcutaneous	„	„	Coarse	R.R.	3	3	I.R.	† 10th day of tick irritation	
U.	Heifer 1022	—	—	„	„	„	„	I.R.	3	3	I.R.	† 30th day of tick irritation	
V.	Heifer 1114	—	—	„	„	„	Lumps	I.R.	3	2 & 3	R.P. †	—	
W.	Heifer 1059	—	—	„	„	„	„	R.R.	3	—	N.R.	R.P. †	Death complicated with redwater.

EXPLANATION OF SYMBOLS.

R.P. †.—Indicates that the animal had a reaction, accompanied with the presence of plasma bodies, and died of East Coast fever.

R.P.R.—Indicates that the animal had a reaction, accompanied with the presence of plasma bodies, and recovered.

R.R.—Indicates that the animal had a reaction and recovered, but that plasma bodies were not detected.

I.R.—Indicates that the animal had an irregular reaction and recovered.

N.R.—Indicates that the animal did not react to the injection.

† O.C.—Indicates that the animal died later of other causes, and that East Coast fever could not be considered to be in any way responsible for death.

† G.P.—Indicates that the animal died of gangrenous pneumonia.

RESULTS.

Of twenty-three animals injected with material taken from heifer 1053 (which was killed twenty-seven days after tick infestation or eight days after the first rise of temperature), one died of East Coast fever as the result of an intrajugular injection, and seven showed reactions indicative of East Coast fever; one animal died before the disease had time to run its course.

Of the remaining fourteen animals, ten showed irregular reactions, and four gave negative results. Of the ten which showed irregular reactions, two died of other causes before they could be tested, and of the four which gave negative results, two also died before testing.

Of the seventeen animals which were exposed to tick infestation or natural infection, nine died of East Coast fever, five died of other causes, and three survived.

Of these three survivors, one had been injected intrathoracally with 15 grammes spleen pulp (lumps) of heifer 1053, but had also been used previously, so that it is difficult to say which injection conferred immunity; the second animal had been injected intrajugularly with 20 grammes spleen pulp (coarse grain) of heifer 1053, and this animal had also been treated previously; the third animal had been injected once only, with 20 grammes spleen pulp (coarse grain) of heifer 1053.

One case (heifer 1019) is of the utmost importance. This animal reacted to the injection and recovered; when tested with ticks it showed a typical East Coast fever reaction, accompanied with plasma bodies, and recovered, and when exposed to natural infection in the veld it again contracted East Coast fever and died, thus indicating that even an immunity obtained by recovery from natural infection does not completely protect against a subsequent attack of the disease.

 EXPERIMENT No. 7.

TO NOTE THE EFFECT OF THE INJECTION OF MATERIAL TAKEN FROM HEIFER 1107.

NOTE.—Heifer 1107, about two years old; purchased in the Cape Province.

Treatment.—Infested on the 20th October, 1910, with six brown adults collected off certain cattle in Natal which at that time were suffering from East Coast fever (Reference No. 349).

Remarks.—The temperature commenced to rise on the 14th day, touching 106° F. three days later and 106·8° F. on the 22nd day, from which date a descent was noticed, and the animal was killed on the 26th day when the temperature was 104·4° F.

Examination of the glands on the 15th day proved negative, but on the 18th day agamogonous forms were present and on the same day *Theileria parva* were found in the blood. On the date of slaughter the parasites were frequently noted in the blood, and both gamogonous and agamogonous forms were noted in the glands and spleen.

NOTE.—This animal was killed on the day of the remission, at the conclusion of the first half of the reaction.

(a) INTRAJUGULAR INJECTIONS on the 15th November, 1910, with 40 c.c. spleen pulp (coarse grain) of Heifer 1107.

{A}.—Ox 1048, about three years old; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously on three occasions without contracting the disease, namely: On the 4th May, 1910, for an intralymphal injection of gland juice of cow 596 (*vide* Annual Report, 1909–10, p. 48); on the 22nd July, 1910, for an intralymphal injection of spleen pulp of heifer 913 [*vide* Experiment No. 2 (h)]; and on the 22nd August, 1910, for an intrajugular injection of spleen and gland pulp of heifer 908 [*vide* Experiment No. 5 (g)].

Treatment.—Injected as above.

Remarks.—Temperature: Some irregular records were noted for the first few days, and a reaction set in from the 22nd day, reaching 103° F. as the maximum.

Immunity Test.—Infested on the 14th December, 1910, with two brown nymphae off each of heifers Nos. 1107, 1053, 1112, and 1109 (Reference Nos. 434, 411, 420, and 412). [*Note.*—See Experiment No. 25 (e); heifer 909 contracted East Coast fever from the infestation of four ticks of the same batch.]

Remarks.—Four ticks were fast the following day. A reaction commenced about the 10th day, reaching 104° F. on the 17th day and 106° F. two days later. There was a remission on the 22nd day and a continuance of the curve from the 23rd to 35th days, when the animal died. *Theileria parva* was noted in the blood on the 21st day, and on the same day plasma bodies were seen in the glands.

(b) INTRAJUGULAR INJECTIONS on the 15th November, 1910, with 30 c.c. spleen pulp (coarse grain) of Heifer 1107.

{B}.—Bull 1039, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously on three occasions, namely: On the 4th May, 1910, for an intralymphal injection of gland juice of cow 596 (*vide* Annual Report, 1909–10, p. 48); on the 18th July, 1910, for an intralymphal injection of spleen pulp of heifer 1011 [*vide* Experiment No. 1 (g)]; and on the 22nd August, 1910, for an intrajugular injection of spleen and glands of heifer 908 [*vide* Experiment No. 5 (f)].

Treatment.—Injected as before.

Remarks.—No temperature reaction.

Immunity Tests.—

(1) Infested on the 14th December, 1910, with two brown adults off each of heifers 1107, 1053, 1112, and 1109. [*Note.*—See Experiment No. 25 (e); heifer 909 contracted East Coast fever from the infestation of four ticks of the same batch.]

Remarks.—No ticks were found the following day: no reaction followed.

(2) Reinfested on the 19th December, 1910, with eight brown adults as above.

Remarks.—Two ticks were found fast the next day; no reaction followed.

- (3) Exposed on the farm Burnside on the 7th January, 1911, and died on the 24th day of East Coast fever; examination of the spleen and glands revealed the presence of plasma bodies in rare numbers.

(c) INTRAJUGULAR INJECTIONS on the 15th November, 1910, with 20 c.c. spleen pulp (coarse grain) of Heifer 1107.

(C).—Ox 1038, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously on three occasions without contracting the disease, namely: On the 4th May, 1910, for an intralymphal injection of gland juice of cow 596 (*vide* Annual Report, 1909–10, p. 48); on the 22nd July, 1910, for an intralymphal injection of spleen pulp of heifer 913 [*vide* Experiment No. 2 (g)]; and on the 22nd August, 1910, for an intrajugular injection of spleen and gland pulp of heifer 908 [*vide* Experiment No. 5 (e)].

Treatment.—Injected as above.

Remarks.—Temperature: A slight reaction from the 10th to 16th day, but the evening records never exceeded 103° F.

Immunity Test.—Infested on the 14th December, 1910, with two brown adults off each of heifers 1107, 1053, 1112, and 1109. [*Note.*—See Experiment No. 25 (e); heifer 909 contracted East Coast fever from the infestation of four ticks of the same batch.]

Remarks.—Four ticks were fast the following day. A reaction set in from the 13th day, with a maximum record of 106.4° F., culminating in the death of the animal on the 22nd day. *Theileria parva* were noted in the blood for the first time on the 19th day and two days later agametes were frequently met with in the glands.

(D).—Heifer 1108, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in August, 1910.

Treatment.—Injected as above.

Remarks.—Temperature: An irregular reaction followed, continuing until the 27th day, with evening rises to over 103° F. on two occasions.

Immunity Tests.—

(1) Infested on the 14th December, 1910, with two brown adults off each of heifers 1107, 1053, 1112, and 1109. [*Note.*—See Experiment No. 25 (c); heifer 909 contracted East Coast fever from the infestation of four ticks of the same batch.]

Remarks.—Five ticks were fast the following day. Some irregular records were noted, but in no way characteristic of East Coast fever.

(2) Exposed on the farm Burnside on the 7th January, 1911, and died on the 9th day of tick irritation and poverty. Microscopical examination of the blood revealed the lesions of anisocytosis, poikilocytosis, and polychromasia; norma-blasts were also noted. With the exception of basophilia, the glands and spleen gave negative results.

(E).—Ox 1100, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously, without contracting the disease, on the 17th August, 1910, for an intrathoracal injection of spleen and gland pulp of heifer 561 [*vide* Experiment No. 4 (*d*)].

Treatment.—Injected as above.

Remarks.—No temperature reaction.

Immunity Test.—Infested on the 14th December, 1910, with two brown adults off each of heifers 1107, 1053, 1112, and 1109. [*Note*.—See Experiment No. 25 (*e*); heifer 909 contracted East Coast fever from the infestation of four ticks of the same batch.]

Remarks.—Two ticks were fast the following day. The animal was killed on the 5th day on account of debility.

(F).—Cow 1032, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously on three occasions without contracting the disease, namely: On the 4th May, 1910, for an intralymphal injection of gland juice of cow 596 (*vide* Annual Report, 1909–10, p. 47); on the 22nd July, 1910, for an intralymphal injection of gland pulp of heifer 913 [*vide* Experiment No. 2 (*i*)]; and on the 22nd August, 1910, for an intrajugular injection of spleen and gland pulp of heifer 908 [*vide* Experiment No. 5 (*d*)].

Treatment.—Injected as above.

Remarks.—No temperature reaction.

Immunity Test.—Infested on the 14th December, 1910, with two brown adults off each of heifers 1107, 1053, 1112, and 1109. [*Note*.—See Experiment No. 25 (*e*); heifer 909 contracted East Coast fever from the infestation of four ticks of the same batch.]

Remarks.—Five ticks were fast the following day; a reaction commenced the 12th day, reaching 106·4° F. five days later. There was a remission on the 22nd day and a continuance of the curve until the 26th day when the animal died of East Coast fever. *Theileria parva* was also noted in the blood for the first time on the 19th day, and two days later plasma bodies were frequently met with in the glands.

(G).—Cow 1031, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been previously used on two occasions without contracting the disease, namely: On the 4th May, 1910, for an intralymphal injection of gland juice of cow 596 (*vide* Annual Report, 1909–10, p. 47); and on the 22nd August, 1910, for an intrajugular injection of spleen and gland pulp of heifer 908 [*vide* Experiment No. 5 (*e*)].

Treatment.—Injected as above.

Remarks.—Temperature: A slight reaction from the 17th to 21st days, with a maximum temperature of 103·2° F.

Immunity Tests.—

(1) Infested on the 14th December, 1910, with two brown adults off each of heifers 1107, 1053, 1112, and 1109. [*Note*.—See Experiment No. 25 (*e*); heifer 909 contracted East Coast fever from the infestation of four ticks of the same batch.]

- (2) Reinfested on the 19th December, 1910, with eight brown adults as above.

Remarks.—Three ticks were fast the following day; irregular reactions followed, with a maximum of 103.4° F. on one occasion.

- (3) Exposed on the farm Burnside on the 7th January, 1911, and was still alive on the 31st August, 1911.

(H).—*Heifer* 1106, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in August, 1910.

Treatment.—Injected as above.

Remarks.—Temperature: Reaction from the 8th day, lasting until the 19th day, with slight evening rises, but never exceeding 103° ; on an average the temperature remained about 101° to 102° F.

Immunity Tests.—

- (1) Infested on the 14th December, 1910, with two brown adults off each of heifers 1107, 1053, 1112, and 1109. [*Note.*—See Experiment No. 25 (e); heifer 909 contracted East Coast fever from the infestation of four ticks of the same batch.]

Remarks.—One tick was fast the following day; no reaction followed.

- (2) Exposed on the farm Burnside on the 7th January, 1911. A reaction set in soon after exposure, during which small piroplasms were occasionally noted in the blood. The heifer died on the 30th day and examination of the blood showed *Babesia bigemina* and the lesions of anisocytosis, poikilocytosis, and basophilia. *Babesia bigemina* were also noted in the spleen. One plasma body was detected in the glands.

(I).—*Ox* 1101, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously on one occasion without contracting the disease, namely, on the 17th August, 1910, for an intrathoracal injection of spleen and gland pulp of heifer 1107 [*vide* Experiment No. 4 (e)].

Treatment.—Injected as above.

Remarks.—Temperature: A slight irregular reaction followed, with evening records not exceeding 102° F.

Immunity Tests.—

- (1) Infested on the 14th December, 1910, with two brown adults off each of heifers 1107, 1053, 1112, and 1109. [*Note.*—See Experiment No. 25 (e); heifer 909 contracted East Coast fever from the infestation of four ticks of the same batch.]

Remarks.—Four ticks were fast the following day; no reaction followed.

- (2) Exposed on the farm Burnside on the 7th January, 1911, and was still alive on the 31st August, 1911.

(J).—*Heifer* 1105, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in August, 1910.

Treatment.—Injected as before.

Remarks.—The animal died on the 2nd day from pneumonia.

SUMMARY OF EXPERIMENT No. 7,

With Material from Heifer 1107.

NUMBER OF DAYS WHICH ELAPSED BETWEEN INFESTATION OF ANIMAL WITH TICKS AND DEATH: 26.

NUMBER OF DAYS WHICH ELAPSED BETWEEN THE DATE OF THE FIRST RISE OF TEMPERATURE AND DEATH: 12.

(No bacteria were found in the smears taken immediately after death.)

DETAILS OF INJECTIONS AND RESULTS.									DETAILS OF TESTS ON IMMUNITY.				REMARKS.	
Ref. No.	Animal injected.	No. of times the animal was injected previously or subsequently.	References to these injections.	Method of injection.	Quantity injected.	Material injected.		Result.	No. of times tested with ticks.	Result.		Result of exposure at Burnside.		
						Pulp of	Grain.			No. of tick infestation.				
A.	Ox 1048	3	A. R. 1909-10; Expts. 2 H & 5 G	Intrajugular	40 c.c.	Spleen	Coarse	I.R.	1	1	R.P. †	—	Cause of death attributed to tick irritation. Killed on the 5th day on account of debility.	
B.	Bull 1039	3	A. R. 1909-10; Expts. 1 G & 5 F	"	30 c.c.	"	"	N.R.	2	—	N.R.	R.P. †.		
C.	Ox 1038	3	A. R. 1909-10; Expts. 2 G & 5 E	"	20 c.c.	"	"	I.R.	1	1	R.P. †	—		
D.	Heifer 1108	—	—	"	"	"	"	I.R.	1	1	I.R.	† 9th day		
E.	Ox 1100	1	Expt. 4 D	"	"	"	"	N.R.	1	—	—	—		
F.	Cow 1032	3	A. R. 1909-10; Expts. 2 I & 5 D	"	"	"	"	N.R.	1	1	R.P. †	—		
G.	Cow 1031	2	A. R. 1909-10; Expt. 5 C	"	"	"	"	I.R.	2	2	I.R.	Still alive (236 days)		
H.	Heifer 1106	—	—	"	"	"	"	R.R.	1	—	N.R.	R.P. †.		Death complicated with redwater.
I.	Ox 1101	1	Expt. 4 E	"	"	"	"	I.R.	1	—	N.R.	Still alive (236 days)		
J.	Heifer 1105	—	—	"	"	"	"	I.R. † Pneumonia 2nd day	1	—	N.R.	Still alive (236 days)		

EXPLANATION OF SYMBOLS.

R.P. †.—Indicates that the animal had a reaction, accompanied with the presence of plasma bodies, and died of East Coast fever.

I.R.—Indicates that the animal had an irregular reaction and recovered.

R.R.—Indicates that the animal had a reaction and recovered, but that plasma bodies were not detected.

N.R.—Indicates that the animal did not react to the injection.

RESULTS.

Of ten animals injected intrajugularly with spleen pulp (coarse grain) of heifer 1107 (which was killed on the 26th day after tick infestation or twelve days after the first rise of temperature), one died of pneumonia on the 2nd day; one had a reaction indicative of East Coast fever, but died of this disease complicated with redwater when exposed to natural infection. The remaining eight animals had either no reactions or irregular reactions, and when exposed to tick infestation or natural infection one was killed on the 5th day on account of debility, one died of tick irritation on the 9th day, four died of East Coast fever, and two survived.

The two survivors had both been injected previously, so that it is impossible to say which injection conveyed immunity.

 EXPERIMENT No. 8.

TO NOTE THE EFFECT OF THE INJECTION OF MATERIAL OBTAINED FROM OX 179.

NOTE.—Ox 179 was infested on the 8th December, 1910, with six brown adults of heifer 1053 (Reference No. 411).

Remarks.—On the 14th day after the first infestation the temperature commenced to rise, reaching 106° F. on the evening of the 17th day; it now descended until the 21st day, when a second rise occurred, the maximum of 106·2° F. being reached four days later. The animal was killed on the 26th day. During the remission of temperature the blood was examined and *Theileria parva* were found to be very frequent; examination of the spleen and glands revealed the presence of plasma bodies in great numbers.

NOTE.—This animal was killed towards the conclusion of the second half of the reaction, and under ordinary conditions the ox would have died within the next day or two.

(a) SUBCUTANEOUS INJECTIONS on the 3rd January, 1911, with 20 c.c. spleen pulp (coarse grain) of Ox 179.

(A).—Cow 294, aged; purchased in the Transvaal; history unknown.

Treatment.—Injected as above.

Remarks.—Temperature: A slight rise ensued immediately after injection and a swelling was noted at the seat of injection.

Immunity Test.—Infested on the 30th January, 1911, with twenty brown nymphae off cattle 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Sixteen ticks were fast the following day; a typical reaction followed, and the animal died on the 29th day of East Coast fever, complicated with redwater (28th February, 1911). Microscopical examination of the blood and glands proved the presence of the parasites in large numbers.

(B).—*Heifer* 606, about four years old ; taken over from the Africander Stock Farm.

Treatment.—Injected as above.

Remarks.—Temperature : No reaction followed. A slight swelling formed at the seat of injection.

[NOTE.—Used on the 17th February, 1911 [see Experiment No. 10 (b)], for an intrajugular injection of spleen pulp of ox 007, and was killed on account of gangrenous pneumonia on the 11th day.

(C).—*Cow* 951, about nine years old ; purchased in the Transvaal ; history unknown.

Treatment.—Injected as above.

Remarks.—Temperature : An evening record of 104° F. was noted on the three succeeding days, and there was a swelling at the seat of inoculation.

NOTE.—Used on the 17th February, 1911, for an intrajugular injection of spleen and gland pulp of ox 007 [*vide* Experiment No. 10 (v)], when it died of gangrenous pneumonia.

(D).—*Cow* 973, about four years old ; purchased in the Transvaal ; history unknown.

Treatment.—Injected as above.

Remarks.—A slight swelling appeared at the seat of inoculation, but no reaction ensued.

NOTE.—Used later on the 17th February, 1911, for an intrajugular injection of spleen and gland pulp of ox 007 [*vide* Experiment No. 10 (j)], when it died of purulent pneumonia on the 9th day.

(E).—*Cow* 974, about four years old ; purchased in the Transvaal ; history unknown.

Treatment.—Injected as above.

Remarks.—Temperature : A slight rise was noted immediately afterwards, and a swelling appeared at the seat of injection.

NOTE.—Used on the 6th March, 1911, for an intrajugular injection of spleen pulp of bull 950 [*vide* Experiment No. 15 (d)], when the animal died of East Coast fever, complicated with gangrenous pneumonia, on the 20th day.

(F).—*Cow* 978, about eight years old ; purchased in the Transvaal ; history unknown.

Treatment.—Injected as above.

Remarks.—Temperature : No reaction followed ; there was a slight swelling noted at the seat of injection.

NOTE.—Used on the 17th February, 1911, for an intrajugular injection of spleen and glands of ox 007 [*vide* Experiment No. 10 (k)], when the animal died of gangrenous pneumonia on the 8th day.

(G).—*Ox* 1025, aged ; purchased in the Transvaal ; history unknown.

NOTE.—This animal had been used previously [*vide* Annual Report, 1909–10, p. 28, and Experiment No. 5 (b)], when it was infected intrajugularly with 5 c.c. spleen and gland pulp of ox 908, without results.

Treatment.—Injected as above.

Remarks.—Temperature: A swelling was noted at the seat of injection and a rise of temperature ensued, but of a very irregular character and in no way typical for East Coast fever.

Immunity Tests.

- (1) Infested on the 30th January, 1911, with twenty brown nymphae off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g)], heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Twenty ticks were fast the following day; a typical East Coast fever reaction followed; all microscopical examination gave negative results, and examination of gland juice obtained by puncture on the 20th day also proved negative.

- (2) Infested on the 27th February, 1911, with twenty brown nymphae off heifer 909 (Reference No. 373). (*Note.*—See above.)

Remarks.—All twenty ticks were fast the following day; no temperature reaction followed; all microscopical examinations gave negative results.

- (3) Exposed on farm Burnside on the 28th April, 1911, and died on the 19th day of poverty. Microscopical examination of the spleen and glands gave negative results.

(H).—Ox 1097, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously for an intrathoracal injection of spleen and gland pulp of heifer 561 [*vide* Experiment No. 4 (c)], but without contracting East Coast fever.

Treatment.—Injected as above.

Remarks.—Temperature: No reaction followed; there was a slight swelling noted at the seat of injection. The animal died on the 18th day from anaemia.

(b) INJECTIONS on the 3rd January, 1911, with 10 c.c. spleen pulp (coarse grain) of Ox 179.

(I).—Calf 1142, three and a half months old; born in the Laboratory stables.

Treatment.—Injected as above.

Remarks.—Temperature: No definite reaction ensued.

NOTE.—The calf was used on the 17th February, 1911, for an intrajugular injection of spleen and gland pulp of ox 007 in Experiment No. 10 (f), when it died of gangrenous pneumonia seven days later.

(c) INTRAJUGULAR INJECTIONS on the 3rd January, 1911, with 20 c.c. spleen pulp (coarse grain) of Ox 179.

(J).—Heifer 838, about four years old; purchased in the Cape Province.

Treatment.—Injected as above.

Remarks.—Temperature: No reaction followed.

Immunity Test.—Infested on the 13th March, 1911, with twenty brown adults off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Eight ticks were fast the following day; a typical East Coast fever reaction followed; microscopical examination of blood and examination of gland juice obtained by puncture on the 24th day proved the presence of the parasites. The animal died on the 28th day of East Coast fever, when plasma bodies were noted in the organs.

(K).—*Heifer* 886, about three years old; purchased in the Cape Province.

Treatment.—Injected as above.

Remarks.—Temperature: No reaction.

Immunity Test.—Infested on the 30th January, 1911, with twenty brown nymphae off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Eighteen ticks were fast the following day; after an incubation time of eleven days, East Coast fever developed, and the animal died on the 27th day. Examination of the blood during life showed the presence of the parasites, and plasma bodies were found in the organs on *post-mortem* examination.

(L).—*Heifer* 889, about three and a half years old; purchased in the Cape Province.

Treatment.—Injected as above.

Remarks.—Temperature: A slight rise was noted on the 11th and 12th days, but nothing typical for East Coast fever.

NOTE.—Used on the 19th February, 1911, in Experiment No. 12 (c), for an intrajugular injection of spleen pulp of heifer 1158, and died two days afterwards from gangrenous pneumonia.

(M).—*Heifer* 902, about four years old.

Treatment.—Injected as above.

Remarks.—No temperature reaction ensued.

NOTE.—Used on the 19th February, 1911, in Experiment No. 12 (d), for an intrajugular injection of spleen and gland pulp of heifer 1158, and died of gangrenous pneumonia four days later.

(N).—*Heifer* 904, aged; purchased in the Cape Province.

Treatment.—Injected as above.

Remarks.—No temperature reaction ensued.

NOTE.—Used on the 19th February, 1911, in Experiment No. 12 (b), for an intrajugular injection of 30 c.c. spleen pulp of heifer 1158, and was killed sixteen days later on account of gangrenous pneumonia.

(O).—*Cow* 971, about five years old; purchased in the Transvaal; history unknown.

Treatment.—Injected as above.

Remarks.—Temperature: Excepting an evening exacerbation to 104° F. on the 3rd day no reaction ensued.

Immunity Test.—Infested on the 30th January, 1911, with twenty brown nymphae off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Eighteen ticks were fast the following day; a typical East Coast fever reaction followed, and the animal died on the 23rd day. *Theileria parva* appeared in the blood for the first time on the 19th day, and plasma bodies were noted in the organs on *post-mortem* examination.

(P).—Cow 1023, aged; purchased in the Transvaal; history unknown.

NOTE.—Used previously on the 4th May, 1910 (*vide* Annual Report, 1909–10, p. 49), also in Experiment No. 2 (j), for an intralymphal injection of 5 c.c. glands of heifer 913, and again in Experiment No. 5 (a), for an intrajugular injection of 20 c.c. spleen and gland pulp of heifer 913, all with negative results.

Treatment.—Injected as above.

Remarks.—No temperature reaction ensued.

Immunity Test.—Infested on the 30th January, 1911, with twenty brown nymphae off Ox 179 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Nineteen ticks were found fast the following day; a temperature reaction ensued from the 12th day; *Theileria parva* appeared in the blood for the first time on the 19th day. The animal died of East Coast fever on the 27th day. Plasma bodies were noted in all organs at *post-mortem* examination.

(Q).—Cow 1064, aged; purchased in the Transvaal; history unknown.

NOTE.—Used on the 3rd June, 1910 (*vide* Annual Report, 1909–10, p. 48), and in Experiment No. 6 (i) on the 27th October, 1910, for an intralymphal injection of 20 grammes spleen pulp of heifer 1053, without results.

Treatment.—Injected as above.

Remarks.—The animal had to be killed on the fifth day on account of anaemia.

(d) INTRAJUGULAR INJECTIONS on the 3rd January, 1911, with 10 c.c. spleen pulp (coarse grain) of Ox 179.

(R).—Calf 1115, five months old; born in the Laboratory stables.

Treatment.—Injected as above.

Remarks.—No temperature reaction.

Immunity Test.—Infested on the 30th January, 1911, with twenty brown nymphae off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Eighteen ticks were fast the following day. Temperature reaction set in from the 15th day. *Theileria parva* appeared in the blood for the first time on the 16th day. The animal died of East Coast fever on the 26th day; plasma bodies were noticed in the glands and spleen on *post-mortem* examination.

(e) INTRATHORACAL INJECTIONS on the 3rd January, 1911, with 20 c.c. spleen pulp (coarse grain) of Ox 179.

(S).—Heifer 985, about two years old; purchased in the Transvaal; history unknown.

Treatment.—Injected as above.

Remarks.—Temperature: A sharp rise was noted on the 12th day to 104° F., followed by a remission to normal two days later.

Immunity Test.—Infested on the 30th January, 1911, with twenty brown nymphae off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Sixteen ticks were fast the following day; a temperature reaction followed from the 11th day. *Theileria parva* appeared in the blood for the first time on the 16th day. The animal was killed on account of East Coast fever on the 25th day. Plasma bodies were noted in the glands and spleen at the *post-mortem* examination.

(T).—Heifer 988, about two years old; purchased in the Transvaal; history unknown.

Treatment.—Injected as above.

Remarks.—No temperature reaction ensued.

NOTE.—Used later on the 19th February, 1911, in Experiment No. 12 (e), for an intrajugular injection of 30 c.c. spleen and glands of heifer 1158, and died eleven days later of purulent pneumonia.

(U).—Ox 1037, aged; purchased in the Transvaal; history unknown.

NOTE.—This animal had been previously used on three occasions [*vide* (a) Annual Report, 1909–10, p. 48], on the 25th May, 1910, for an intralymphal injection of lymphatic gland juice of heifer 928; [*vide* (b) Experiment No. 1 (h)], on the 18th July, 1910, for an intralymphal injection of spleen pulp of heifer 1011; and [*vide* (c) Experiment No. 6 (g)] on the 27th October, 1910, for grafting of lymphatic gland of heifer 1053, without contracting the disease.

Treatment.—Injected as above.

Remarks.—No temperature reaction ensued.

Immunity Test.—Infested on the 30th February, 1911, with twenty brown nymphae off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—All ticks were fast the following day; a temperature reaction ensued from the 11th day; *Theileria parva* appeared in the blood for the first time on the 16th day. The animal died of East Coast fever on the 23rd day, when plasma bodies were noted in the glands and spleen at *post-mortem* examination.

(V).—*Bull* 1045, about four years old; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously on two occasions without contracting the disease, namely: On the 18th July, 1910, for an intralymphal injection of 20 c.c. glands of heifer 1011 [Experiment No. 1 (i)]; and on the 27th October, 1910, for an intrasplenic injection of 20 grammes spleen pulp of heifer 1053 [Experiment No. 6 (p)]. It had also been infected with ticks on the 5th September, 1910 [*vide* Experiment No. 1 (i)], without result.

Treatment.—Injected as before.

Remarks.—Temperature: An irregular reaction followed, and the animal died on the 15th day of toxæmia.

(W).—*Heifer* 1086, about three years old; purchased in May, 1910.

Treatment.—Injected as above.

Remarks.—A slight temperature reaction followed, but not typical for East Coast fever.

NOTE.—Used on the 19th February, 1911, in Experiment No. 12 (a), for an intrajugular injection of spleen pulp of heifer 1158, and died three days later of purulent pneumonia.

(X).—*Heifer* 1087, about three years old; a Cape Province animal; purchased in May, 1910.

NOTE.—This animal had been previously used on the 27th October, 1910, in Experiment No. 6 (s), for an intraperitoneal injection of 15 grammes spleen pulp of heifer 1053, without result.

Treatment.—Injected as above.

Remarks.—Irregular temperature records were noted, but not typical for East Coast fever.

Immunity Tests.—

- (1) Infested on the 30th January, 1911, with twenty brown nymphæ off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Nineteen ticks were fast the following day; a fever reaction followed; microscopical examination of the blood on the 16th day proved the presence of small piroplasms. Examination of gland juice obtained by puncture on the 20th day proved negative.

- (2) Infested on the 20th February, 1911, with twenty brown nymphæ off heifer 909 (Reference No. 373). (*Note.*—See above.)

Remarks.—All ticks were fast the following day; no temperature reaction followed, and all microscopical examinations gave negative results.

- (3) Exposed at the farm Burnside on the 28th April, 1911, and died on the 32nd day of poverty. Microscopical examination of the blood, glands, and spleen showed the presence of *Babesia bigemina*.

(Y).—*Heifer* 1160, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in October, 1910.

Treatment.—Injected as above.

Remarks.—No temperature reaction ensued.

NOTE.—Used on the 19th February, 1911, and 13th March, 1911, in Experiment No. 24 (*d*), for an intrajugular (double) injection of 30 c.c. spleen glands of heifer 1158 and 20 c.c. spleen of heifer 950. A reaction followed, and plasma granules were noted in the lymphatic glands twenty days after the first injection. It was later exposed at Burnside, and was still alive on the 31st August, 1911.

(Z).—*Heifer* 1161, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in October, 1910.

Treatment.—Injected as above.

Remarks.—Temperature: A slight reaction followed immediately after injection, but not of any definite character.

NOTE.—Used on the 6th March, 1911, in Experiment No. 15 (*b*), for an intrajugular injection of 20 c.c. spleen pulp of heifer 950, when it contracted East Coast fever and recovered. Exposed at Burnside on the 28th April, 1911, and died of poverty thirty-three days later.

SUMMARY OF EXPERIMENT No. 8,

With Material from Ox 179.

NUMBER OF DAYS WHICH ELAPSED BETWEEN INFESTATION OF ANIMAL WITH TICKS AND DEATH: 26.

NUMBER OF DAYS WHICH ELAPSED BETWEEN THE DATE OF THE FIRST RISE OF TEMPERATURE AND DEATH: 12.

(No bacteria were found in the smears taken immediately after death.)

DETAILS OF INJECTIONS AND RESULTS.									DETAILS OF TESTS ON IMMUNITY.				REMARKS.
Ref. No.	Animal injected.	No. of times the animal was injected previously or subsequently.	References to these injections.	Method of injection.	Quantity injected.	Material injected.		Result.	No. of times tested with ticks.	Result.		Result of exposure at Burnside.	
						Pulp of	Grain.			No. of tick infestation.			
A.	Cow 294	—	—	Subcutaneous	20 c.c.	Spleen	Coarse	N.R.	1	1	R.P. †	—	Death complicated with redwater. For final history see Experiment 10 B (died gangrenous pneumonia) For final history see Experiment 10 v (died gangrenous pneumonia) For final history see Experiment 10 j (died gangrenous pneumonia) For final history see Experiment 15 D (died East Coast fever and gangrenous pneumonia) For final history see Experiment 10 K (died gangrenous pneumonia)
B.	Heifer 606	1	Expt. 10 B	"	"	"	"	N.R.	—	—	—	—	
C.	Cow 951	1	Expt. 10 v	"	"	"	"	N.R.	—	—	—	—	
D.	Cow 973	1	Expt. 10 J	"	"	"	"	N.R.	—	—	—	—	
E.	Cow 974	1	Expt. 15 D	"	"	"	"	N.R.	—	—	—	—	
F.	Cow 978	1	Expt. 10 K	"	"	"	"	N.R.	—	—	—	—	† Poverty 19th day
G.	Ox 1025	2	A. R. 1909-10; Expt. 5 B	"	"	"	"	I.R.	2	1	R.R.	—	
H.	Ox 1097	1	Expt. 4 C	"	"	"	"	† Anaemia 18th day N.R.	—	—	—	—	
I.	Calf 1142	1	Expt. 10 F	"	10 c.c.	"	"	N.R.	—	—	—	—	For final history see Experiment 10 F (died gangrenous pneumonia)
J.	Heifer 838	—	—	Intrajugular	20 c.c.	"	"	N.R.	1	1	R.P. †	—	
K.	Heifer 886	—	—	"	"	"	"	N.R.	1	1	R.P. †	—	

L.	Heifer 889	1	Expt. 12 C	"	"	"	"	I.R.	—	—	—	—	For final history see Experiment 12 C (died gangrenous pneumonia)
M.	Heifer 902	1	Expt. 12 D	"	"	"	"	N.R.	—	—	—	—	
N.	Heifer 904	1	Expt. 12 B	"	"	"	"	N.R.	—	—	—	—	For final history see Experiment 12 B (died gangrenous pneumonia)
O.	Cow 971	—	—	"	"	"	"	N.R.	1	1	R.P. †	—	
P.	Cow 1023	3	A. R. 1909-10; Expts. 2 J & 5 A	"	"	"	"	N.R.	1	1	R.P. †	—	For final history see Experiment 12 B (died gangrenous pneumonia)
Q.	Cow 1064	2	A. R. 1909-10; Expt. 6 I	"	"	"	"	Killed 5th day on account of anaemia	—	—	—	—	
R.	Calf 1115	—	—	"	"	10 c.c.	"	N.R.	1	1	R.P. †	—	For final history see Experiment 12 B (died gangrenous pneumonia)
S.	Heifer 985	—	—	Intrathoracal	"	20 c.c.	"	I.R.	1	1	R.P. †	—	
T.	Heifer 988	1	Expt. 12 E	"	"	"	"	N.R.	—	—	—	—	For final history see Experiment 12 E (died gangrenous pneumonia)
U.	Ox 1037	3	A. R. 1909-10; Expts. 1 H & 6 C	"	"	"	"	N.R.	1	1	R.P. †	—	
V.	Bull 1045	2	Expts. 1 I & 6 P	"	"	"	"	† Toxaemia 15th day	—	—	—	—	For final history see Experiment 12 E (died gangrenous pneumonia)
W.	Heifer 1086	1	Expt. 12 A	"	"	"	"	I.R.	—	—	—	—	
X.	Heifer 1087	1	Expt. 6 S	"	"	"	"	I.R.	2	1	R.R.	† 32nd day O.C.	Death due to poverty and redwater.
Y.	Heifer 1160	Double Injection	Expt. 24 D	"	"	"	"	N.R.	—	—	—	—	
Z.	Heifer 1161	1	Expt. 15 B	"	"	"	l,	I.R.	—	—	—	—	For final history see Experiment 15 B († Poverty at Burnside).

EXPLANATION OF SYMBOLS.

R.P. †.—Indicates that the animal had a reaction, accompanied with the presence of plasma bodies, and died of East Coast fever.
R.P.R.—Indicates that the animal had a reaction, accompanied with the presence of plasma bodies, and recovered.
P. †.—Indicates that the animal died before the disease had run its course, but that plasma bodies were found in the spleen or glands after death.

R.R.—Indicates that the animal had a reaction and recovered, but that plasma bodies were not detected.
I.R.—Indicates that the animal had an irregular reaction and recovered.
N.R.—Indicates that the animal did not react to the injection.
† O.C.—Indicates that the animal died later of other causes, and that East Coast fever could not be considered to be in any way responsible for death.

RESULTS.

Of twenty-six animals injected with material taken from ox 179 (which was killed twenty-six days after the infestation with ticks, or twelve days after the first rise of temperature), none contracted the disease. Two died and one was killed before the disease had time to run its course; the remaining twenty-three all showed irregular or no reactions. Of these twenty-three, ten died of gangrenous pneumonia in subsequent experiments, and one died of East Coast fever complicated with gangrenous pneumonia.

The remaining twelve were infested with ticks or exposed to veld infection, and eight died of East Coast fever, two died of poverty before the disease had time to run its course, one died of other causes on the 32nd day after exposure, and one survived. This survivor had been used in subsequent experiments, so that it is difficult to say which injection conveyed immunity.

EXPERIMENT No. 9.

TO NOTE THE EFFECT OF THE INJECTION OF MATERIAL OBTAINED FROM HEIFER 909.

NOTE.—Heifer 909 was infested on the 14th December, 1910, with two brown adults off each of heifers 1107 (Reference No. 434), 1053 (Reference No. 411), 1112 (Reference No. 420), and 1109 (Reference No. 412).

Remarks.—On the following day four ticks were found fast. After an incubation time of fourteen days the temperature commenced to rise, lasting until the 20th day; a remission occurred the following day, and a second reaction commenced from the 22nd day, reaching its maximum on the 29th day. The heifer was killed on the 31st day (14th January, 1911). Examination of blood revealed the presence of *Theileria parva* for the first time on the 18th day; agamogonous forms were detected in the glands on the 15th day. Examination of the glands and spleen on *post-mortem* showed the presence of plasma bodies in large numbers.

(a) INTRAJUGULAR INJECTIONS on the 14th January, 1911, with 20 c.c. spleen pulp (coarse grain) of Heifer 909.

(A).—Cow 567, about four years old; purchased in the Transvaal; history unknown.

Treatment.—Injected as above.

Remarks.—

(a) A slight temperature reaction followed, lasting for three days.

On the 18th day a sharp rise to 103° F. was registered.

(b) Microscopical examination of blood: Negative. Puncture of the lymphatic glands on the 19th, 20th, 21st, and 23rd days gave negative results.

Immunity Test.—Infested on the 10th February, 1911, with twenty brown nymphae off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Nineteen ticks were fast the following day. A typical East Coast fever reaction followed from the 11th day, terminating in the death of the animal on the 30th day. *Theileria parva* were noted in the blood during the reaction, and on *post-mortem* examination the glands and spleen showed the presence of plasma granules.

(B).—*Cow* 678, aged; purchased in the Transvaal; history unknown.

Treatment.—Injected as above.

Remarks.—

- (a) Temperature: Reaction from the 13th day, lasting for three days; second reaction from the 20th to 24th days, with a maximum temperature of 104.6° F.
- (b) Microscopical examination of blood: Anisocytosis and eosinophilia were noted on the 19th day. Puncture of the lymphatic glands on the 19th, 20th, 21st, and 23rd days gave negative results.

Immunity Tests.—

- (1) Infested on the 10th February, 1911, with twenty brown nymphæ off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Eighteen ticks were fast the following day. No reaction followed.

- (2) Reinfested on the 26th February, 1911, with twenty brown nymphæ off heifer 909 (as above).

Remarks.—Twenty ticks were fast the following day. No reaction followed.

- (3) Exposed on the farm Burnside on the 26th April, 1911, and was still alive on the 31st August, 1911.

(C).—*Heifer* 900, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in October, 1909.

Treatment.—Injected as above.

Remarks.—

- (a) Temperature: Reaction followed from the 14th to 21st days, with a maximum of 105° F. on the 17th day.
- (b) Microscopical examination of blood: Small piroplasms were noted on the 16th day, increasing in number with the onset of the fever. Puncture of the lymphatic glands on the 19th day revealed the presence of plasma bodies.

Immunity Tests.—

- (1) Infested on the 10th February, 1911, with twenty brown nymphæ off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Nineteen ticks were fast the following day. No reaction followed.

- (2) Reinfested on the 26th February, 1911, with twenty brown nymphæ off heifer 909 (as above).

Remarks.—Eighteen ticks were fast the following day. No reaction followed.

- (3) Exposed on the farm Burnside on the 26th April, 1911, and was still alive on the 31st August, 1911.

(D).—Heifer 906, about two and a half years old, a Cape Province animal, which arrived at the Laboratory in November, 1909.

Treatment.—Injected as above.

Remarks.—

- (a) Temperature: A slight reaction followed, lasting for the first few days. From the 12th day a second reaction ensued, continuing for about ten days.
- (b) Microscopical examination of blood: Small piroplasms were noted on the 19th, 20th, and 21st days. *Babesia bigemina* were seen on the 20th day. Puncture of the lymphatic glands on the 19th, 21st, and 23rd days gave negative results.

Immunity Test.—Infested on the 10th February, 1911, with twenty brown nymphae off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Sixteen ticks were fast the following day. A typical East Coast fever reaction followed from the 10th day, culminating in the death of the heifer on the 24th day. *Theileria parva* were noted in the blood for the first time on the 15th day, and on the same date plasma bodies were detected in the glands.

(E).—Heifer 1009, about three years old, a Cape Province animal, which arrives at the Laboratory in May, 1910.

Treatment.—Injected as above.

Remarks.—

- (a) Temperature: A slight reaction followed from the 11th day (with a remission on the 17th and 18th days), lasting until the 26th day.
- (b) Microscopical examination of blood: Negative. Puncture of the lymphatic glands on the 19th, 21st, and 23rd days gave negative results.

Immunity Tests.—

- (1) Infested on the 10th February, 1911, with twenty brown nymphae off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Twenty ticks were fast the following day. No reaction followed.

- (2) Reinfested on the 26th February, 1911, with twenty brown adults off heifer 909 (see above).

Remarks.—All ticks were fast the following day. No reaction followed.

- (3) Exposed on the farm Burnside on the 26th April, 1911. A reaction ensued from the 15th day, and plasma bodies were noted in the glands on the 20th and 22nd days. Death occurred on the 45th day, when the examination of the blood showed the presence of *Babesia bigemina* and anisocytosis. No parasites could be detected in the smears from the gland or spleen.

(F).—*Heifer* 1021, about three years old, a Cape Province animal, which arrived at the Laboratory in March, 1910.

Treatment.—Injected as above.

Remarks.—

- (a) Temperature: An immediate reaction followed, returning to normal on the 8th day. A slight reaction ensued five days later, continuing until the 25th day.
- (b) Microscopical examination of blood: Small piroplasms were noted on the 20th and 21st days. Puncture of the lymphatic glands on the 19th, 21st, and 23rd days gave negative results.

Immunity Tests.—

- (1) Infested on the 10th February, 1911, with twenty brown nymphae off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Fourteen ticks were fast the following day. No reaction followed.

- (2) Reinfested on the 26th February, 1911, with twenty brown nymphae off heifer 909 (as above).

Remarks.—Four ticks were fast the following day. No reaction followed.

- (3) Exposed on the farm Burnside on the 26th April, 1911, and was still alive on the 31st August, 1911.

(G).—*Heifer* 1154, about two years old, a Cape Province animal, which arrived at the Laboratory in October, 1910.

Treatment.—Injected as above.

Remarks.—An immediate reaction ensued from the 2nd to 8th days; a typical East Coast fever reaction followed from the 9th day. *Theileria parva* were detected in the blood for the first time on the 18th day; plasma bodies were found in the glands on the 19th day.

The animal died of East Coast fever on the 25th day, and examination of the glands and spleen showed the presence of plasma bodies.

(H).—*Heifer* 1156, about three years old, a Cape Province animal, which arrived at the Laboratory in October, 1910.

Treatment.—Injected as above.

Remarks.—A temperature reaction followed immediately, lasting for seven days. The heifer had an accident on the 14th day and had to be killed.

Microscopical examination of the spleen after death revealed the presence of one plasma body (agamogenous form).

(I).—*Heifer* 1190, about two years old, a Cape Province animal, which arrived at the Laboratory in December, 1910.

Treatment.—Injected as above.

Remarks.—

- (a) Temperature: A slight reaction ensued for the first few days; from the 13th day another reaction set in, with evening records of 104° F., returning to normal on the 26th day.
- (b) Microscopical examination of blood: Small piroplasms were noted on the 16th and 17th days. Puncture of the lymphatic glands from the 17th to 22nd days gave negative results.

Immunity Test.—Infested on the 10th February, 1911, with twenty brown nymphae off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Sixteen ticks were fast the following day. A reaction followed from the 8th day, terminating in the death of the heifer on the 13th day. Examination of glands and spleen proved negative, and the diagnosis of anaemia was made.

(b) INTRAJUGULAR INJECTIONS on the 14th January, 1911, with 40 c.c. spleen pulp (coarse grain) of Heifer 909.

(J).—Heifer 1088, about two years old, a Cape Province animal, which arrived at the Laboratory in May, 1910.

Treatment.—Injected as above.

Remarks.—

(a) Temperature: An immediate reaction ensued, lasting until the 13th day, from which date another reaction set in, continuing until the 24th day.

(b) Microscopical examination of blood: *Babesia bigemina* were noted on the 16th day; small piroplasms were seen on the 18th and 19th days. Puncture of the lymphatic glands on the 19th, 21st, and 23rd days gave negative results.

Immunity Tests.—

(1) Infested on the 10th February, 1911, with twenty brown nymphae off heifer 909 (Reference No. 373). [*Note.*—See Experiment No. 25 (g); heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—Sixteen ticks were fast the following day. No reaction followed.

(2) Reinfested on the 26th February, 1911, with twenty brown nymphae off heifer 909 (see above).

Remarks.—Fourteen ticks were fast the following day. No reaction followed.

(3) Exposed on the farm Burnside on the 28th April, 1911. A reaction set in from the 13th day, and plasma bodies were found in the glands a few days later. The animal died on the 27th day of East Coast fever complicated with redwater. *Theileria parva* and *Babesia bigemina* were noted in the blood, and the latter were also detected in smears from the glands and spleen.

SUMMARY OF EXPERIMENT No. 9,

With Material from Heifer 909.

NUMBER OF DAYS WHICH ELAPSED BETWEEN INFESTATION OF ANIMAL WITH TICKS AND DEATH: 31.

NUMBER OF DAYS WHICH ELAPSED BETWEEN THE DATE OF THE FIRST RISE OF TEMPERATURE AND DEATH: 17.

(No bacteria were found in the smears taken immediately after death.)

DETAILS OF INJECTIONS AND RESULTS.						DETAILS OF TESTS ON IMMUNITY.				REMARKS.	
Ref. No.	Animal injected.	Method of injection.	Quantity injected.	Material injected		Result.	No. of times tested with ticks.	Result.			Result of exposure at Burnside.
				Pulp of	Grain.			No. of tick infestation.			
A.	Cow 567	Intrajugular	20 c.c.	Spleen	Coarse	I.R.	1	1	R.P. †	—	Death complicated with redwater.
B.	Cow 678	"	"	"	"	I.R.	2	—	N.R.	Still alive (127 days)	
C.	Heifer 900	"	"	"	"	R.P.R.	2	—	N.R.	" — "	
D.	Heifer 906	"	"	"	"	I.R.	1	1	R.P. †	" — "	
E.	Heifer 1009	"	"	"	"	R.R.	2	—	N.R.	R.P. † 45th day.	
F.	Heifer 1021	"	"	"	"	R.R.	2	—	N.R.	Still alive (127 days)	
G.	Heifer 1154	"	"	"	"	R.P. †	—	—	—	—	
H.	Heifer 1156	"	"	"	"	P. †	—	—	—	—	
I.	Heifer 1190	"	"	"	"	R.R.	1	1	† 13th day of anaemia	—	
J.	Heifer 1088	"	40 c.c.	"	"	R.R.	2	—	N.R.	R.P. † 27th day.	

EXPLANATION OF SYMBOLS.

R.P. †.—Indicates that the animal had a reaction, accompanied with the presence of plasma bodies, and died of East Coast fever.

R.P.R.—Indicates that the animal had a reaction, accompanied with the presence of plasma bodies, and recovered.

P. †.—Indicates that the animal died before the disease had run its course, but that plasma bodies were found in the spleen or glands after death.

R.R.—Indicates that the animal had a reaction and recovered, but that plasma bodies were not detected.

I.R.—Indicates that the animal had an irregular reaction and recovered.

N.R.—Indicates that the animal did not react.

RESULTS.

Of ten animals injected intrajugularly with spleen pulp (coarse grain) of heifer 909 (which was killed thirty-one days after tick infestation, or seventeen days after the first rise of temperature), three showed plasma bodies in the lymphatic glands as a result of the injection, of which two died. Four had reactions indicative of East Coast fever and the remainder had irregular reactions.

Of eight animals exposed to tick infestation or natural infection, four died of East Coast fever, one of anaemia, and the remaining three were still alive.

These three survivors had all been injected intrajugularly with 20 c.c. spleen pulp, and had not been used previously.

EXPERIMENT No. 10.

TO NOTE THE EFFECT OF THE INJECTION OF MATERIAL TAKEN FROM OX 007.

NOTE.—Ox 007 was infected on the 21st January, 1911, with brown nymphae off heifer 1087 (Reference No. 430). Three days later fourteen nymphae were found fast. On the 12th day a reaction started, reaching 106° F. three days later. A remission took place on the 20th day, and the second half of the reaction set in the following day, reaching the maximum temperature on the 26th day; the ox was killed on the 27th day (17th February, 1911). *Theileria parva* were noted in the blood for the first time on the 18th day, when plasma bodies were detected in the lymphatic glands. Towards the end of the second half of the reaction plasma bodies were frequently found in the lymphatic glands. On *post-mortem* examination, plasma bodies were found in the spleen and glands in fairly large numbers. The presence of cocci was registered in the glands, spleen, and liver smears.

NOTE.—This ox was killed towards the end of the second half of the reaction.

(a) INTRAJUGULAR INJECTIONS on the 17th February, 1911, with 30 c.c. spleen and gland pulp (coarse grain) of Ox 007.

(A).—Cow 526, about five years old, a Cape Province animal, which arrived at the Laboratory in January, 1908.

Treatment.—Injected as above.

Remarks.—A temperature reaction ensued soon after the injection, but the temperature did not exceed 103° F. The cow was noted to be off feed and showed evidences of severe illness. She was killed on the 17th day and *post-mortem* examination revealed the presence of a gangrenous pneumonia.

(B).—Heifer 606, about three years old, an Africander heifer, which arrived at the Laboratory in July, 1910.

NOTE.—This animal had been used previously on one occasion without contracting the disease, namely, on the 3rd January, 1911, for a subcutaneous injection of spleen pulp of ox 179 [*vide* Experiment No. 8 (b)].

Treatment.—Injected as above.

Remarks.—A temperature reaction set in immediately, the temperature rising to 103·6° F. the same day. The heifer showed symptoms of severe illness and succumbed on the 11th day; *post-mortem* examination revealed the presence of a gangrenous pneumonia.

(C).—*Calf* 1131, about six months old ; born in the Laboratory stables.

Treatment.—Injected as above.

Remarks.—The animal died immediately after injection, of embolism.

(b) INTRAJUGULAR INJECTIONS on the 17th February, 1911, with 20 c.c. spleen and gland pulp (coarse grain) of Ox 007.

(D).—*Heifer* 987, about two years old ; purchased in the Transvaal ; history unknown.

Treatment.—Injected as above.

Remarks.—Temperature : A reaction set in the following day and the animal was noticed to be off feed. It developed all the symptoms of pneumonia, and died on the 8th day, when gangrenous pneumonia was diagnosed.

(E).—*Cow* 380, aged ; purchased in the Transvaal ; history unknown.

Treatment.—Injected as above.

Remarks.—A slight fever set in the next day and the animal did not feed ; it developed all the symptoms of pneumonia, and died on the 6th day. *Post-mortem* examination showed the presence of a gangrenous pneumonia.

(F).—*Calf* 1142, about five months old ; born in the Laboratory stables.

NOTE.—This animal had been previously injected on one occasion without contracting the disease, namely, on the 3rd January, 1911, for a subcutaneous injection of spleen pulp of ox 179 [*vide* Experiment No. 8 (v)].

Treatment.—Injected as above.

Remarks.—The following day the calf was not feeding ; it died on the 6th day, and gangrenous pneumonia was diagnosed.

(c) INTRAJUGULAR INJECTIONS on the 17th February, 1911, with 25 c.c. of a mixture containing 30 grammes spleen and gland pulp (coarse grain) of Ox 007, added to 20 grammes peptone.

(G).—*Heifer* 947, about four years old ; purchased in the Transvaal ; history unknown.

Treatment.—Injected as above.

Remarks.—

- (a) Temperature : A slight reaction ensued, from which the animal recovered ; it is, however, doubtful if the material reached the jugular vein, as a large abscess developed at the seat of injection.
- (b) Microscopical examination of blood : Small piroplasms in very rare numbers and all the lesions of anaemia were seen on the 18th day. Puncture of the lymphatic glands on the previous and same days gave negative results.

Immunity Test.—Infested on the 9th March, 1911, with twenty brown nymphae off heifer 909 (Reference No. 373). [*Note.*—Experiment No. 25 (g) ; heifer 668 contracted East Coast fever from the infestation of twenty ticks of the same batch.]

Remarks.—All ticks were fast the following day. A typical East Coast fever followed from the 10th day; *Theileria parva* were detected in the blood for the first time on the 26th day; plasma bodies were found in the glands on the 25th day. The animal died of East Coast fever on the 27th day, and examination of the glands and spleen showed the presence of plasma bodies.

(d) INTRAJUGULAR INJECTIONS on the 17th February, 1911, with 25 c.c. of a mixture consisting of 30 grammes spleen and gland pulp (coarse grain) added to 20 grammes bile of Ox 007.

(H).—Cow 949, about five years old; purchased in the Transvaal; history unknown.

Treatment.—Injected as above.

Remarks.—The animal was not feeding the following day; a high fever set in, and death occurred on the 10th day of gangrenous pneumonia.

(e) INTRAJUGULAR INJECTIONS on the 17th February, 1911, with 25 c.c. of a mixture consisting of 30 grammes spleen and gland pulp (coarse grain) of Ox 007, added to 20 grammes quartz sand.

(I).—Bull 989, about two years old; purchased in the Transvaal; history unknown.

Treatment.—Injected as above.

Remarks.—The animal was not feeding the following day; all the symptoms of pneumonia developed with a high fever reaction, and death occurred on the 8th day from gangrenous pneumonia.

(f) INTRAJUGULAR INJECTIONS on the 17th February, 1911, with 25 c.c. of a mixture consisting of 30 grammes spleen and gland pulp (coarse grain) added to 20 grammes of liver pulp of Ox 007.

(J).—Cow 973, about four years old; purchased in the Transvaal; history unknown.

NOTE.—This animal had been previously used on one occasion without contracting the disease, namely, on the 3rd January, 1911, for a sub-cutaneous injection of spleen pulp of ox 179 [*vide* Experiment No. 8 (d)].

Treatment.—Injected as above.

Remarks.—Temperature: A high fever was noticed the following day, when the animal refused to feed. The symptoms of pneumonia developed, of which the animal died on the 9th day. *Post-mortem* examination proved the presence of a gangrenous pneumonia.

(g) INTRAJUGULAR INJECTIONS on the 17th February, 1911, with 25 c.c. of a mixture consisting of 30 grammes spleen and gland pulp (coarse grain) added to 20 grammes of liver pulp of Ox 007.

(K).—Cow 978, about eight years old; purchased in the Transvaal; history unknown.

NOTE.—This animal had been used previously on one occasion without contracting the disease, namely, on the 3rd January, 1911, for a sub-cutaneous injection of spleen pulp of Ox 179 [*vide* Experiment No. 8 (f)].

Treatment.—Injected as above.

Remarks.—Temperature: A high fever set in the following day and the animal refused to feed; all the symptoms of pneumonia developed, and the animal died on the 8th day, the cause of death being attributed to gangrenous pneumonia.

(h) INTRAJUGULAR INJECTIONS *on the 17th February, 1911, with 25 c.c. of a mixture consisting of 30 grammes spleen and gland pulp (coarse grain) added to 20 grammes muscle pulp of Ox 007.*

(L).—*Heifer 868, about five years old, a Cape Province animal, which arrived at the Laboratory in May, 1909.*

Treatment.—Injected as above.

Remarks.—A high fever set in the following day; the animal refused to feed, and developed all the symptoms of pneumonia. Death occurred on the 10th day of gangrenous pneumonia.

(i) INTRAJUGULAR INJECTIONS *on the 17th February, 1911, with 25 c.c. of a mixture consisting of 30 grammes spleen and gland pulp (coarse grain) added to 20 grammes of brain pulp of Ox 007.*

(M).—*Heifer 986, about two years old; purchased in the Transvaal; history unknown.*

Treatment.—Injected as above.

Remarks.—A high fever set in the following day; the animal refused to feed, and all the symptoms of pneumonia developed. Death occurred on the 4th day, the diagnosis of gangrenous pneumonia being made.

(j) INTRAJUGULAR INJECTIONS *on the 17th February, 1911, with 25 c.c. of a mixture consisting of 30 grammes spleen and gland pulp added to 20 grammes kidney pulp of Ox 007.*

(N).—*Cow 951, about nine years old; purchased in the Transvaal; history unknown.*

NOTE.—This animal had been used previously on one occasion without contracting the disease, namely, on the 3rd January, 1911, for a subcutaneous injection of spleen pulp of ox 179 [*vide* Experiment No. 8 (c)].

Treatment.—Injected as above.

Remarks.—Temperature: A high fever set in immediately with a maximum of 106° F.; all the symptoms of pneumonia developed, and the animal died on the 7th day of gangrenous pneumonia.

SUMMARY OF EXPERIMENT NO. 10,

With Material from Ox 007.

NUMBER OF DAYS WHICH ELAPSED BETWEEN INFESTATION OF ANIMAL WITH TICKS AND DEATH: 27.

NUMBER OF DAYS WHICH ELAPSED BETWEEN THE DATE OF THE FIRST RISE OF TEMPERATURE AND DEATH: 15.

(Cocci were found in the smears taken immediately after death.)

DETAILS OF INJECTIONS AND RESULTS.								DETAILS OF TESTS ON IMMUNITY.			REMARKS	
Ref. No.	Animal injected.	No. of times the animal was injected previously or subsequently.	References to these injections.	Method of injection.	Quantity injected.	Material injected.		Result.	No. of times tested with ticks.	Result.		
						Pulp or	Grain.			No. of tick infestation.		
A.	Cow 526	—	—	Intrajugular	30 c.c.	Spleen and gland.....	Coarse	† G.P. 17th day.	—	—	—	
B.	Heifer 606	1	Expt. 8 B	"	"	" "	"	† G.P. 11th day.	—	—	—	
C.	Calf 1131	—	—	"	"	" "	"	† Embolism.	—	—	—	
D.	Heifer 987	—	—	"	20 c.c.	" "	"	† G.P. 8th day.	—	—	—	
E.	Cow 380	—	—	"	"	" "	"	† G.P. 6th day.	—	—	—	
F.	Calf 1142	1	Expt. 8 I	"	"	" "	"	† G.P. 6th day.	—	—	—	
G.	Heifer 947	—	—	"	25 c.c.	Spleen, gland, and peptone.....	"	N.R.	1	1	R.P. †	
H.	Cow 949	—	—	"	"	Spleen, gland, and bile.....	"	† G.P. 10th day.	—	—	—	
I.	Bull 989	—	—	"	"	Spleen, gland, and quartz sand.....	"	† G.P. 8th day.	—	—	—	
J.	Cow 973	1	Expt. 8 D	"	"	Spleen, gland, and liver pulp.....	"	† G.P. 9th day.	—	—	—	
K.	Cow 678	1	Expt. 8 F	"	30 c.c.	" "	"	† G.P. 8th day.	—	—	—	
L.	Heifer 868	—	—	"	25 c.c.	Spleen, gland, and muscle pulp.....	"	† G.P. 10th day.	—	—	—	
M.	Heifer 986	—	—	"	"	Spleen, gland, and brain macerate.....	"	† G.P. 4th day.	—	—	—	
N.	Cow 951	—	—	"	"	Spleen, gland, and kidney pulp.....	"	† G.P. 7th day.	—	—	—	

EXPLANATION OF SYMBOLS.

R.P. †.—Indicates that the animal had a reaction, accompanied with the presence of plasma bodies, and died of East Coast fever.

N.R.—Indicates that the animal did not react.

† G.P.—Indicates that the animal died of gangrenous pneumonia

RESULTS.

Of fourteen animals injected intrajugularly with material taken from ox 007 (which was killed twenty-seven days after the infestation of ticks, or fifteen days after the first rise of temperature), one died of embolism immediately after injection, and twelve died of gangrenous pneumonia. The remaining animal did not react to the injection, but when infested with ticks it contracted East Coast fever and died.

(It must be remembered here that cocci were found in the smears taken from ox 007 after slaughter.)

EXPERIMENT No. 11.

TO NOTE THE EFFECT OF THE INJECTION OF MATERIAL OBTAINED FROM HEIFER 1155.

NOTE.—Heifer 1155 was infested on the 23rd January, 1911, with ten brown nymphae off heifer 1109 (Reference No. 412), of which ten adults were fast the following day.

Remarks.—A typical East Coast fever reaction followed from the 11th day, with the remission on the 18th day. *Theileria parva* were detected in the blood for the first time on the 19th day; plasma bodies were found in the glands on the same day.

The animal was killed on account of East Coast fever on the 26th day, and examination of the glands and spleen showed the presence of plasma bodies; *Babesia bigemina* were also noted in the glands.

(a) INTRAJUGULAR INJECTIONS on the 18th February, 1911, with 30 c.c. spleen pulp (coarse grain) of Heifer 1155.

(A).—Cow 976, about seven years old; purchased in the Transvaal; history unknown.

Treatment.—Injected as above.

Remarks.—

(a) Temperature: Some disturbances were noted for the first few days and a slight curve was noticed from the 14th to 19th days.

(b) Microscopical examination of blood: Negative. Puncture of the lymphatic glands on the 17th, 20th, and 23rd days gave negative results.

Immunity Test.—Exposed on the farm Burnside on the 26th April, 1911, and died on the 19th day of tick irritation. Microscopical examination of the blood, glands, and smears gave negative results.

(B).—Cow 977, about eight years old; purchased in the Transvaal; history unknown.

Treatment.—Injected as above.

Remarks.—

(a) Temperature: A reaction followed from about the 13th day, with a maximum temperature of 107° F. on the 24th day, and the following day the cow was killed on account of East Coast fever.

- (b) Microscopical examination of blood: Negative, until the 24th day, when small piroplasms were detected. Puncture of the lymphatic glands on the 16th, 17th, and 21st days showed the presence of plasma bodies; they were noted to be very frequent in the smears made from the spleen on *post-mortem*.

NOTE.—Material from this cow was used for inoculation purposes (*vide* Experiment No. 17).

- (b) INTRAJUGULAR INJECTIONS on the 18th February, 1911, with 25 c.c. spleen and gland pulp (coarse grain) of Heifer 1155.

- (C).—Cow 952, about nine years old; purchased in the Transvaal; history unknown.

Treatment.—Injected as above.

Remarks.—Some irregular temperatures were noted for the first few days, but a typical East Coast fever reaction followed from the 15th day. *Theileria parva* were not detected in the blood, but plasma bodies were found in the glands on the 22nd and 23rd days in very rare numbers.

The animal was killed on the 23rd day, being *in extremis*. Examination of the glands and spleen showed the presence of plasma bodies, and in the blood were seen mono-nuclear corpuscles containing plasma bodies.

NOTE.—Material from this cow was used for inoculation purposes (*vide* Experiment No. 16).

- (c) INTRAJUGULAR INJECTIONS on the 18th February, 1911, with 10 c.c. spleen and gland pulp (coarse grain) of Heifer 1155.

- (D).—Calf 1136, about eight months old; born in the Laboratory stables.

Treatment.—Injected as above.

Remarks.—

- (a) Temperature: Some irregular records were noted, but not characteristic of East Coast fever.
- (b) Microscopical examination of blood: Negative. Puncture of the lymphatic glands on the 26th day showed the presence of plasma bodies.

Immunity Test.—Exposed on the farm Burnside on the 3rd May, 1911, and was still alive on the 31st August, 1911.

SUMMARY OF EXPERIMENT No. 11,

With Material from Heifer 1155.

NUMBER OF DAYS WHICH ELAPSED BETWEEN INFESTATION OF ANIMAL WITH TICKS AND DEATH: 26.

NUMBER OF DAYS WHICH ELAPSED BETWEEN THE DATE OF THE FIRST RISE OF TEMPERATURE AND DEATH: 15.

(No bacteria were found in the smears taken immediately after death.)

DETAILS OF INJECTIONS AND RESULTS.						Result.	Result of exposure at Burnside.	REMARKS.
Ref. No.	Animal injected.	Method of injection.	Quantity injected.	Material injected.				
				Pulp of	Grain.			
A.	Cow 976	Intrajugular	30 c.c.	Spleen.....	Coarse	I.R.	† 19th day, tick irritation.	
B.	Cow 977	"	"	"	"	R.P. †	—	Material from cow 977 was used for inoculation purposes (<i>vide</i> Experiment No. 17). Material from heifer 952 was used for inoculation purposes (<i>vide</i> Experiment No. 16).
C.	Cow 952	"	25 c.c.	Spleen and gland	"	R. P. †	—	
D.	Calf 1136	"	10 c.c.	" "	"	I.R.	Still alive (120 days).	

EXPLANATION OF SYMBOLS.

R.P. †.—Indicates that the animal had a reaction, accompanied with the presence of plasma bodies, and died of East Coast fever.

I.R.—Indicates that the animal had an irregular reaction and recovered.