

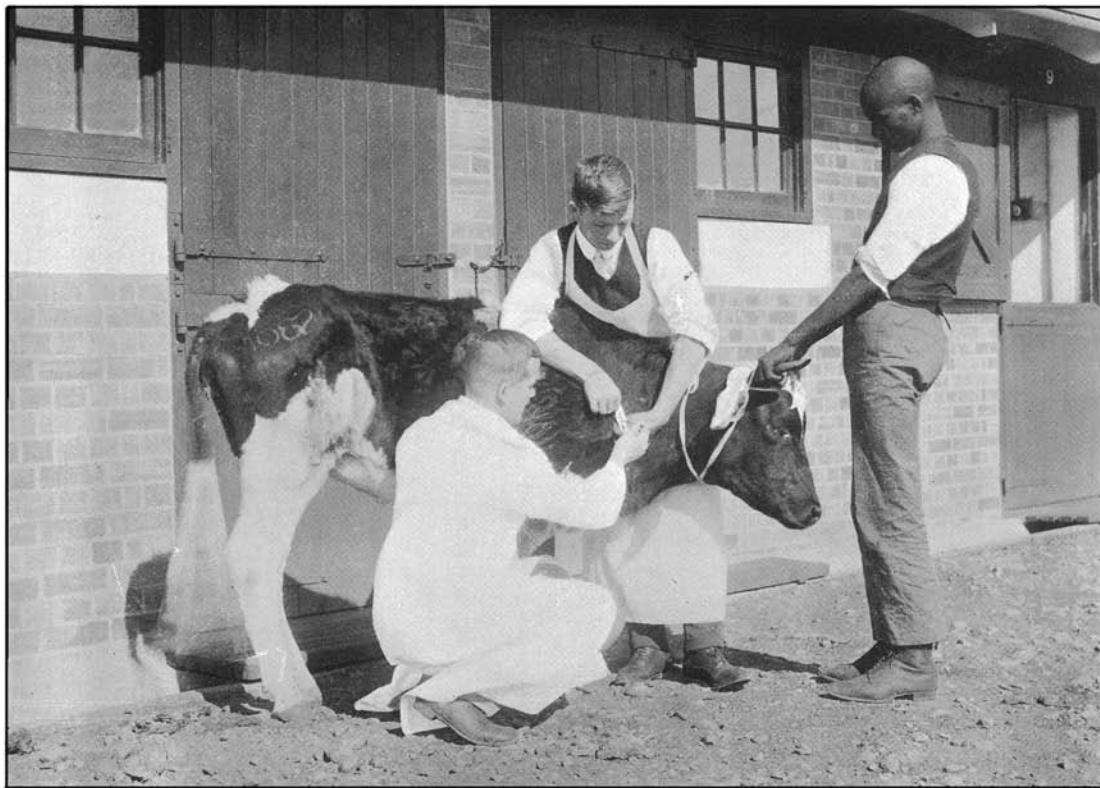
× Indicates the position of the lymphatic glands used for puncturing.

FIGURE 1.



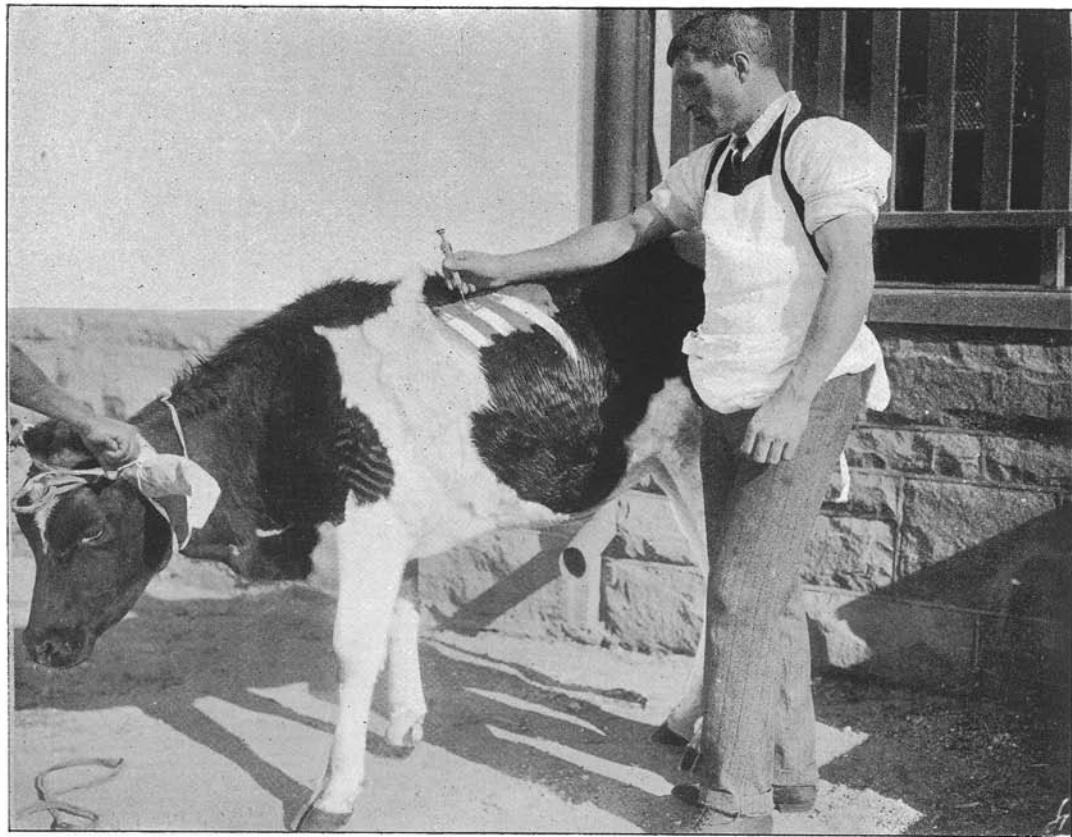
Artificial transmission of East Coast Fever. Puncturing the precaral gland.

FIGURE 2.



Puncturing the prescapular gland.

FIGURE 3.



Puncturing the Spleen in the space between the 11th and 12th ribs.

FIGURE 4.

NOTE.—In Appendices 3 and 4 all cases of animals dying of other causes and all experiments with blood have been excluded.

IV.	A.	Piece of spleen ..	H. 928 Cow 677	42 1	O. 102z H. 829	Intralymphal Subcutaneous	No reaction ..	Not tested ..	—
	B.	Lymphatic glands ..	Cow 677	2	H. 896	Subcutaneous	Atypical reaction ..	No reaction ..	—
	C.	Lymphatic gland juice	H. 884	3	C. 877	Subcutaneous	Irregular reaction ; died of East Coast fever on 17th day	—	See Experiments III (II, and III (35)).
V.	A.	Pieces of spleen ..	Cow 596	4	C. 1023	Subcutaneous	No reaction ..	Not tested ..	—
		Spleen pulp .. ..	Cow 594	1	H. 836	Intrathoracal	Slight reaction ..	No reaction ..	—
	C.	Lymphatic glands ..	Cow 596	2	O. 1040	Intrathoracal	Irregular reaction..	East Coast fever re- action; died on 27th day	—
B.	Lymphatic glands ..	Cow 594	3	H. 883	Intrathoracal	Irregular reaction	No reaction ..	—	
	Lymphatic gland juice	Cow 596	4	O. 1026	Intrathoracal	No reaction ..	East Coast fever re- action; killed on account of East Coast fever on 29th day	—	
VI.	A.	Spleen pulp .. ..	Cow 596	1	O. 1042	Intrajugular	Slight reaction ..	Not tested ..	—
	B.	Lymphatic gland juice	Cow 596	2	B. 1047	Intrajugular	Typical reaction ..	No reaction ..	—
		H. 928	3	H. 911	Intrajugular	No reaction ..	Not tested ..	—	
		H. 928	4	H. 627	Intrajugular	Irregular reaction ..	Not tested ..	—	
		H. 928	5	Cow 1033	Intrajugular	Reaction ..	No reaction ..	—	
		H. 928	6	B. 1052	Intrajugular	Irregular reaction ..	Not tested ..	—	
		H. 928	7	Cow 1035	Intrajugular	No reaction ..	Not tested ..	—	
		H. 897	8	H. 831	Intrajugular	No reaction ..	Not tested ..	See Experiments I (7) and III (10).	
		H. 897	9	C. 919	Intrajugular	Slight reaction (red- water)	Reaction and died of East Coast fever on 31st day	—	
		H. 897	10	H. 1078	Intrajugular	Slight reaction (red- water)	Not tested ..	Died 17 days after injection; cause un- known	
VII.	C.	H. 897	11	B. 1071	Intrajugular	No reaction ..	Not tested ..	—	
		H. 897	12	C. 1068	Intrajugular	Irregular reaction ..	Not tested ..	—	
		H. 897	13	H. 1014	Intrajugular	No reaction ..	Not tested ..	See Experiment I (19).	
		H. 928	14	B. 1045	Intrajugular	No reaction ..	Not tested ..	—	
	Lymphatic gland juice	C. 596	1	C. 1034	Intracutaneous	No reaction ..	Not tested ..	—	

B.C.—Bull calf. A.B.—Africander bull. H.—Heifer. M.B.—Madagascar bull. O.—Ox. C.—Calf.

*Summary of Results obtained from  
"A".—Arranged according to Material Used*

MATERIAL USED.	Number of Animals Injected.	RESULT.						
		Typical Reaction.		Atypical Reaction.				
		Died or killed <i>in extremis</i> on account of East Coast Fever.	Recovered and proved immune to a subsequent test.	Died or killed <i>in extremis</i> on account of East Coast Fever.	Recovered and died or killed <i>in extremis</i> on account of East Coast Fever to a subsequent test.	Recovered and proved immune to a subsequent test (no reaction).	Recovered and showed a reaction to a subsequent test.	Recovered and not yet tested.
1	2	3	4	5	6	7	8	9
Spleen .. .. .	1	1	—	—	—	—	—	—
Pieces of Spleen .. .. .	5	1	—	—	—	2	2	—
Spleen pulp .. .. .	11	3	—	2	1	1	—	1
Lymphatic glands .. .. .	13	3	—	—	3	4	—	2
Lymphatic gland juice	53	3	3	1	5	1	—	12
TOTALS .. .. .	83	13	3	3	9	8	2	15

*"B".—Arranged according to Method of*

METHOD OF INJECTION.	1	2	3	4	5	6	7	8	9
Intraperitoneal .. .. .	15	4	—	—	3	3	2	1	—
Intrasplenic .. .. .	6	3	—	2	—	1	—	—	—
Intralymphal .. .. .	40	6	1	—	4	1	—	8	—
Subcutaneous .. .. .	4	—	—	1	—	1	—	1	—
Intrathoracic .. .. .	4	—	—	—	1	2	—	—	—
Intrajugular .. .. .	13	—	2	—	1	—	—	5	—
Intracutaneous .. .. .	1	—	—	—	—	—	—	—	—
TOTALS .. .. .	83	13	3	3	9	8	2	15	—

No. 3.

*the foregoing Experiments :—  
and irrespective of Method of Injection.*

Result—(continued).

No Reaction.	Totals of Columns		3, 4, 5, & 7.		3 & 5, 6 & 10, 4 & 7, 9 & 12, 8 & 11.	
	10	11	12	11	11	11
Died of East Coast Fever to a subsequent test.	—	—	—	1	—	—
Reaction when subsequently tested and recovered.	—	—	—	1	1	—
Not yet tested.	—	—	1	—	—	—
	—	—	1	1	—	—
	—	—	8	7	—	—
	—	—	3	1	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
Number of animals which contracted East Coast Fever from the injection.	—	—	7	3	—	—
Percentage of animals which contracted East Coast Fever from the injection.	—	—	54 %	15 %	—	—
Number of animals which died or were killed on account of East Coast Fever as a result of the injection.	—	—	8	4	—	—
Number of animals which recovered from injection and died of East Coast Fever as a result of the test.	—	—	7	3	—	—
Number of animals which recovered from the injection and which proved immune when tested.	—	—	4	4	—	—
Number of animals not tested and which can be considered to have acquired no immunity.	—	—	26	4	—	—
Number of animals which recovered from the injection and showed a reaction to subsequent test.	—	—	1	—	—	—
	—	—	1	—	—	—
	—	—	26	4	—	—
	—	—	8	3	—	—
	—	—	15 %	7 %	—	—
	—	—	54 %	15 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8	4	—	—
	—	—	3	3	—	—
	—	—	80 %	72 %	—	—
	—	—	100 %	100 %	—	—
	—	—	7	3	—	—
	—	—	8			

## APPENDIX No. 4.

*Result arranged according to Origin and Generation of the Material used for Experimental Transmission.*

NOTE.—The material used in the previous experiments was obtained from either:—

- (a) an animal which contracted East Coast fever from ticks (a pure natural infection);
- (b) from an animal which contracted East Coast fever from experimental injection (origin, first generation, or second generation); or
- (c) from an animal which contracted the disease from ticks, these ticks having been infected by being placed on a beast which contracted East Coast fever by experimental injection (first generation or second generation).



**"A."**

Animals contracting East Coast fever in a natural way by means of ticks.	}	Material from these animals communicated the disease in 12 out of 29 cases.
--	---	---

**Origin ... .. 41 %**

Material from these animals communicated the disease in 7 out of 8 cases.	}	Animals contracting East Coast fever by experimental injections.
---	---	--

**88 %**

**"B."**

**"C."**

Material from these animals communicated the disease in 4 out of 6 cases.	}	Animals contracting East Coast fever by injection of material from above animals (Origin)
---	---	---

**1st Generation ... .. 66 %**

Material from these animals did not transmit the disease in any of the five experimental animals.

**Nil.**

}	Animals contracting East Coast fever in a natural way by ticks which became infected on above animals (Origin).
---	---

53

Material from one animal did not communicate the disease in the experimental animal.	}	Animals contracting East Coast fever by injection of material from above animals of the 1st generation.
--	---	---

**2nd Generation ... .. Nil.**

Material from these animals communicated the disease in 3 out of 32 animals.

**10 %**

}	Animals contracting East Coast fever in a natural way by ticks which became infected on above animals of 1st generation.
---	--

## CONCLUSIONS.

The conclusions from the foregoing experiments can be summarised as follows:—

1. East Coast fever was not transmitted by means of blood of a sick animal either by infusion into the blood system or injection into the peritoneal cavity, the spleen, or the lymphatic glands of five healthy animals.

2. The insertion of the spleen, pieces of the spleen, and injection of spleen pulp into the peritoneal cavity, the spleen, lymphatic glands, thorax, under the skin and into the jugular vein, produced the disease in twelve out of seventeen animals—71 per cent.

3. The insertion of lymphatic glands and injection of lymphatic gland juice by the above-mentioned six methods, and, in addition, intracutaneously, produced the disease in fifteen out of sixty-six animals—23 per cent.

4. The intraperitoneal injection of the whole spleen, pieces of spleen, spleen pulp, lymphatic glands, and lymphatic gland juice, succeeded in seven out of fifteen instances—41 per cent.

5. The intrasplenic injection of spleen pulp and lymphatic gland juice succeeded in six out of six instances—100 per cent.

6. The intralymphal injection of spleen pulp, lymphatic glands, and lymphatic gland juice succeeded in eight out of forty instances—20 per cent.

7. The subcutaneous injection of spleen pulp, lymphatic glands, and lymphatic gland juice succeeded in two out of four instances—50 per cent.

8. The intrathoracal injection of spleen pulp, lymphatic glands, and lymphatic gland juice succeeded in two out of four instances—50 per cent.

9. The intrajugular injection of spleen pulp and lymphatic gland juice succeeded in two out of thirteen instances—15 per cent.

10. The intracutaneous injection of lymphatic gland juice did not transmit the disease in one instance.

11. The material used for these experiments can be classified as follows:—

- (a) From animals which contracted the disease in a natural way from ticks.
- (b) From animals which contracted the disease by inoculation.
- (c) From animals which contracted the disease from ticks, these ticks having been infected by biting animals which contracted the disease by inoculation.

The results were:—

- (a) The disease was produced in 41 per cent.
- (b) The disease was produced in 88 per cent. (origin).  
The disease was produced in 66 per cent. (first generation).
- (c) The disease was produced in nil (first generation).  
The disease was produced in 10 per cent. (second generation).

From this it appears that the disease can be most successfully transmitted with material obtained from experimentally inoculated animals of the origin and first generation.

12. As indicated by the statistics, the disease was not so fatal from artificial transmission as it is under natural conditions. In the transmission experiments by inoculation, the mortality amongst the animals which contracted the disease was sixteen out of twenty-nine—59 per cent.

13. Out of eighty-three animals treated—

- 16 contracted the disease and died;
- 11 recovered and proved immune;
- 11 gave atypical or no reactions, and died to the test;
- 3 gave atypical or no reaction, but recovered when tested;
- 42 were not tested and should be considered not to be immune, the test not being carried out on account of the absence of any symptoms indicating a typical East Coast fever reaction.

The disease transmitted by inoculation did not always resemble the disease contracted by ticks; it was either of a longer or shorter duration.

Piroplasms were not present in every instance, and even the plasma bodies were not found in one instance. The reactions were not always typical, and from the fever reactions in some instances no diagnosis as to the presence of East Coast fever could be made.

14. Immunity was followed in several instances where no definite diagnosis of a previous East Coast fever reaction could be made. Accordingly the absence of piroplasms in the blood, or of the gamogonous or agamogonous forms in the glands, does not of necessity mean that the animal has not become immune against East Coast fever through the inoculation.