appendiculatus) undertaken at the invitation of the colonial secretary, Lord Passfield, acting for the Government of Kenya, and on the recommendation of Sir Arnold Theiler. The experiments were conducted in the Government Laboratories at Kabete near Nairobi. To both the director of agriculture, the Honorable Alexander Holm, and the chief of the Veterinary Research Laboratory, Mr. James Walker, we wish to express our thanks for many courtesies. We are grateful also to Mr. R. Daubney, who was acting chief of the laboratory during a part of our stay in Kabete; to Dr. E. A. Lewis and to Mr. W. B. C. Danks, both of whom helped us in the actual conduct of our experiments.

The observations were made on six principal series of ticks: (1) Infected as larvae; (2) control, fed on a clean animal as larvae; (3, 4 and 5) infected as nymphae; (6) control, fed on a clean animal as nymphae. They were complicated and difficult for three reasons. First, because in some cases only a relatively small percentage of ticks fed on blood containing parasites retain them throughout their life cycle. Second, the uniform presence of symbionts was a confusing factor in the study of smears soon after engorgement. Lastly, the large majority of the ticks, both infective and clean, contained a protozoan parasite, different from that of East Coast fever, with multiplicative phases in the macrophages in the tick's body and to a lesser extent within the intestinal epithelial cells. All the animals used for the feeding of ticks were carefully reared and free from other tick-borne diseases.

We have found that the life cycle of *Theileria parva* in ticks is divisible into the following stages:

(1) Emigration of parasites from the red blood cells into the gut of the tick begins soon, but parasites may remain in the red blood cells for as long as six days after the ticks drop off engorged.

(2) In the lumen of the gut what appear to be male and female forms are distinguishable, and further examination of the material collected may show that it is here that conjugation takes place.

(3) Many of the free forms in the gut are destroyed *in situ;* others are taken up by the intestinal epithelial cells and digested within them in association with digestive spherules; still others penetrate intestinal epithelial cells, which are not provided with digestive spherules, and grow.

(4) These intra-epithelial parasites make their appearance about the sixth day. From the sixth to the twenty-third day their diameter increases approximately five times. They are recognizable up to the thirty-first day, that is to say over the period of moulting which was accomplished in the several infected series on the twenty-fourth, twenty-fourth, twenty-fourth and eighteenth days after engorgement.

(5) From the day before moulting through the actual moulting and as late as the thirty-first day these intra-epithelial forms change into motile euglena-like forms. These euglenoids penetrate the wall of the intestine and enter the body cavity. They make their way to the salivary glands, where they may be seen in contact with the cells. They were last detected in the four series on the thirty-third, thirty-fourth, thirty-fifth and twenty-ninth days, respectively.

(6) Over a period of several days after their formation the euglenoids enter the salivary gland cells. Their entry was not observed in the larval series, but in the three series of nymphae they were seen as early as the twenty-fifth, twenty-third and twenty-second days.

(7) Once within the salivary gland cells the euglenoids rapidly change into deeply staining spore-like structures, which increase in size to form mulberry-like masses. The peripheral swellings on the mulberries give rise to small forms of the parasite which resemble closely those first observed in sick animals. This is the condition of the parasite usually seen in the salivary glands at the time that the next feeding began on the thirty-third, thirty-sixth, thirty-fifth and twenty-ninth days after engorgement.

(8) During the first four days of feeding the small forms increase greatly in number at the expense of the mulberry-like masses. Many of them are discharged into the lumina of the salivary acini, but some were still seen in ticks as late as the twelfth day after attachment.

The bites of ticks belonging to the series containing these parasites in their salivary glands produced East Coast fever in susceptible animals, whereas those of the control, clean ticks which did not possess parasites failed to do so.

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