
THE INCUBATION PERIOD OF MALTA FEVER.

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THE following case is of interest, for it tells us, within certain limits, the incubation period of Malta fever. A knowledge of this period is of the utmost importance, for it enables us to determine the actual mode of infection from amongst the many possible modes which have been enunciated.

H.M.S. *Lancaster*, having been recently built and newly commissioned, left Portland on June 20th, 1904, for the Mediterranean. She sailed direct for Malta, where she arrived on July 1st. The day after her arrival one of the ship's stokers, who was on his first voyage abroad, was sent to the naval hospital at Valetta suffering from "chancroid and bubo." He remained in hospital until July 19th, when he returned direct to his ship, cured. The ship left Malta the next day for the Dardanelles, and remained at sea for three weeks. Two days after leaving Malta this man was taken ill with fever.

On the fifth day of his illness he was tested for the serum reaction, which gave a positive result, and the *Micrococcus melitensis* was subsequently separated from his blood. He was invalided home in the following October.

H.M.S. *Lancaster* did not return to Malta until November, 1904, and no other cases of Malta fever occurred on board until January, 1905. It is obvious, therefore, that this man contracted the disease when in the wards of the naval hospital at Malta—that is, between July 2nd and 18th. Supposing that he became infected on the day that he went to hospital, the longest possible period of his incubation is nineteen days, and the shortest two days. The incubation period of Malta fever is somewhere between these two limits, certainly not longer.

Evidence has already been brought forward to show that the incubation period of the disease in human beings, when it has been contracted naturally, is from eight to eleven days.¹ Experimentally, according to the Malta Fever Commission,² the incubation periods of the possible modes of infection are as follows :

A. *Infection by Dust Mixed with Cultures of the Micrococcus*.—Monkeys fed daily on the artificially-infected dust. Average number of cultures given, twenty-seven. Incubation periods, forty-two to seventy days. Naturally-infected dust given to monkeys failed to produce the disease. Goat fed daily on dust infected with urine containing the micrococcus for thirty-two days ultimately contracted the disease. This experiment has not yet been confirmed.

B. *Infection by Food*.—Four monkeys fed on cultures for sixty, thirty-eight, thirty-five, thirty-eight days contracted Malta fever. The average number of agar cultures eaten by each of these monkeys was ten. One monkey which only ate seven cultures did not contract the disease. One monkey which ate only two cultures did contract the disease after an incubation period of thirty-two days.

C. *Transmission of Malta Fever by Naturally-infected Goat's Milk*.—Four monkeys were fed, on the average, three times a day for forty-seven days (mean) before their bloods reacted. It seems probable that animals fed on very large quantities of the micrococci will show an agglutination reaction without infection by the disease; thus Horrocks states that the agglutinins, but not the disease, may be transmitted to the fetus *in utero*. Also a goat fed on naturally-infected milk three times a day from June 27th until October 7th, showed the presence of agglutinins on the latter date, but the micrococcus was never separated from its blood or milk. All these animals were given enormous doses of the *Micrococcus melitensis*.

Four men, all non-immunes, drank some goat's milk, last September, which contained the micrococcus, but they have not up to the present contracted Malta fever.³ From the beginning of July, 1905, all the milk supplied to the troops in Malta, with the exception of one regiment, was boiled, but the Malta fever admissions increased from 67 in July to 77 in September. The regiment which did not boil its milk had the lowest admission-rate.⁴

The milk supplied to the Malta hospitals has recently been carefully sterilized, but the incidence of the disease increased amongst the patients in their wards after the discovery of the micrococcus in the goat's milk.⁵

D. *Infection by Inoculation and Mosquitos*.—Accidental inoculation in man: incubation period in 3 cases, six days. Experimental inoculation in animals: incubation period, average six days. Natural infection in 4 persons by mosquitos: incubation periods, eight to eleven days.⁶ Accidental infection of a man by a mosquito which had bitten monkeys with Malta fever (the mosquito was found to have the *Micrococcus melitensis* in its stomach): incubation period, eleven days (Horrocks).⁷

The case of Malta fever which occurred on board H.M.S. *Lancaster* can only, according to its incubation period, be classified under the heading D.

REFERENCES.

¹ Ross and Levick, *R.A.M.C. Journal*, August, 1905. ² Reports of the Malta Fever Commission, Parts I, II, III, IV. ³ Ross and Levick, *R.A.M.C. Journal* (letter), November, 1905; also *Journal of Tropical Medicine*, January, 16th, 1906. ⁴ Report of the Malta Fever Commission, Part IV, page 159. ⁵ *R.A.M.C. Journal* (letter), November, 1905. ⁶ Ross and Levick, *R.A.M.C. Journal*, August, 1905. ⁷ Report of the Malta Fever Commission, Part IV, page 76.