from the sensitized guinea pigs was found to be 4.25 to 4.39 seconds.

Summary. With the technic described the mobility velocities of histiocytes obtained from normal guinea pigs were compared with those obtained from guinea pigs sensitized with the H37 strain of living *Mycobacterium tuberculosis.* The cells of the infected animals revealed a trend toward a slower rate. Statistically the difference obtained is significant as the range of the mean of the two in no point coincides. These findings may indicate a difference in surface charge.

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Growth of Louse-Borne Relapsing Fever Spirochetes in Chick Embryo.

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It is well known that important biological differences exist between the tick-borne and louse-borne relapsing fever spirochetes. With the former, infection can readily be produced in a large variety of laboratory animals which together with the tick, serve as means of keeping the strain in the laboratory. On the other hand, few animals were found to be susceptible to the louse-borne type, and the lice cannot be used to maintain the spirochetes. Although Meleney[1] was able to produce infection and relapses in squirrels and chipmunks with a Chinese louse-borne strain of relapsing fever spirochetes, splenectomy of these animals has to be resorted to in order to assure complete success. It is, therefore, of more than academic interest to determine if the louse-borne strains can also be grown and passed in the embryonic chick as is possible for the tick-borne spirochetes,[2, 3, 4] and the preliminary results are herewith communicated.

Blood samples were obtained from 7 patients with louse-borne

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2 Oag, R. K., *J. Path. and Bact.*, 1939, **49**, 339.

3 Chabaud, A., *Bull. Soc. Path. Exot.*, 1939, **32**, 483.

4 Bohls, S. W., Irons, J. V., and Shazo, T. D., PROC. SOC. EXP. BIOL. AND MED., 1940, **45**, 375.

relapsing fever[5, 6, 7] during the febrile stage. Blood was either defibrinated or mixed with sodium citrate, and some samples have been kept in the refrigerator for 2 days before inoculation. Inoculation is made at the pointed end of the egg where a hole in the outer shell was made by a dental drill and sterilized with alcohol followed by flaming. The needle was inserted horizontally either deep into the yolk sac or about 1 cm beneath the chorio-allantoid membrane. About 0.2 cc of infective blood was used for the inoculum. Hard paraffin was used for the sealing. A series of fertilized eggs of from 5-12 days old was inoculated with each sample of blood and examinations were made daily from the second day onward for spirochetes in blood, amniotic fluid, yolk and emulsions of internal organs.

Results. Good growth of spirochetes was seen in eggs from the third day for all the 7 blood samples inoculated, but the maximum growth was most commonly found on the fifth day of infection. The number of organisms was, however, greatly increased after being passed for 3 generations by means of the blood of embryonic chick, but the time of their appearance was not shortened. In agreement with previous workers, infection was limited almost entirely to the blood. Furthermore, soon after the death of the embryo, all the spirochetes were found to have lost their motility, and eventually disappeared. It is evident, therefore, that the multiplication and maintenance of the louse-borne spirochetes in the developing egg depend strictly upon the living embryo. In this sense, the embryonic chick may perhaps be considered and employed as a susceptible animal for the growth and passage of louse-borne relapsing fever spirochetes.

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5 Robertson, R. C., *Chinese Med. J.*, 1932, **46**, 853.

6 Chung, H. L., *Chinese Med. J.*, 1936, **50**, 1723.

7 Chung, H. L., and Wei, Y. L., *Am. J. Trop. Med.*, 1938, **18**, 661.