Life-History of the Sandfly, *Phlebotomus papatasii*.

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(ABSTRACT.)

The author detailed the life-history of the sandfly, *Phlebotomus papatasii*, and illustrated his remarks by a large number of specimens and drawings. He stated that the Royal Air Force Sandfly Fever Commission has shown that the virus of phlebotomus fever was transmitted from generation to generation of *Phlebotomus papatasii*. This may be effected in two ways, either it is transmitted by heredity or the larvae infect themselves in the breeding grounds by eating the excreta or the dead bodies of the parent flies. It follows that prophylactic measures against the fever must be directed upon the fly, the habits and habitats of which must be understood.

The life-history of *Phlebotomus papatasii* covers a period of about six weeks, the exact time depending on conditions of temperature and humidity. The ovum, which measures 0.385 mm. in length by 0.12 mm. in breadth, in its development shows certain changes in its surface markings and on the ninth day caudal bristles appear. A few hours later the shell breaks on the dorsum by the action of the egg-tooth. The larva emerges and enters on its first instar, lasting six days and ending with the first moult. In all, the larva passes through four instars of about six days each; and four moults, during which there occur not only increase in size but developmental changes characterizing each period, such as the disappearance of the egg-tooth, the appearance of two and then four caudal bristles, and of one and then two dark pigment bands on the dorsum of the terminal segments of the body. With the conclusion of the fourth instar the larva enters on the pupal stage, lasting about nine days, before the emergence of the imago. The wings of the newly hatched fly are crumpled and moist. Until these dry the young fly can only crawl. The recognition of this stage is most helpful in detecting the breeding spots of the insect. During the night, when the atmospheric humidity is usually great, the wings cannot dry. The process of drying is generally completed within three hours after dawn, and the mouth parts harden to allow of the sucking of blood during the first twenty-four hours of adult life. Copulation can take place within the next twenty-four hours, and eggs to the number of forty are laid six to ten days later. The length of life of the adult female fly in nature is about two weeks, though in the laboratory life may be prolonged for thirty days or more. It should be noted that, in the summer, only a third of the life of the insect is spent in the imago stage.

It has been found possible, as in the specimens shown of the living larvae and adult flies, to prolong the larval stage considerably by the retarding effect of increased moisture or lowered atmospheric temperature. Hibernation of the insect occurs in the fourth larval stage. Several larvae have been kept in this stage for six months, and then, by reducing the amount of moisture and incubating at 80°F., pupation has occurred. Fully-formed imagines eventually hatched out of the pupae.