

"The pupae are formed in loosely made pupal cases constructed separately from, but near, the feeding burrow. The moths become active about dusk, and are attracted to lights in large numbers. They do not feed, except possibly on water.

"Eggs are dropped promiscuously. The average number produced by one moth is probably about 200 or 250, although one moth laid 564. The moths mate at night; mating was observed only when they were abundant around lights. The normal life of a moth is from 7 to 10 days.

"In the investigation here reported only a single parasite was reared, *Cymodusa mississippiensis*, Ashm. Several predacious enemies were observed feeding on both larvae and adults.

"The use of ordinary poisoned-bran bait gave no apparent results in the control of the larvae, but by combining it with some attractive substance it is possible that an effective bait may yet be devised."

Japanese Beetle Spread

During the period from 1919 to 1929 the area of the United States heavily infested with the Japanese beetle has increased from 48 square miles to 21,353 square miles. In 1929 the heavily infested area included New Jersey, the District of Columbia, eastern Pennsylvania, northern Delaware, and small portions of Connecticut, New York, Maryland, and Virginia. The most isolated point of known infestation was 192 miles by air line from the center of the heavily infested area. The beetles spread of their own accord, by flight, from 10 to 15 miles a year. Their spread by artificial means, as in the transportation of infested soil and nursery stock, can be much greater than this; but the Government's quarantine on the transportation of nursery stock and farm and garden products from the infested areas has succeeded in confining the spread of the beetle practically to its natural flight of 10 to 15 miles a year. There is, however, in addition to the local spread by flight, another type of movement which it is impracticable to attempt to control, and that is the accidental transportation of the beetle on railroad and motor cars. The most outlying points at which the beetle was found in the summer of 1929 included Boston, Mass., Providence, R. I., and Norfolk and Cape Charles, Va. It seems reasonable to infer that the beetle reached these places by the movement of boats from Philadelphia during the height of the travel season, aided possibly also by accidental railroad carriage.

The use of beetle traps at Baltimore, Washington, and in Alexandria County, Va., has resulted in the collection of great numbers of beetles. That enormous quantities of beetles can be collected by trapping has been fully demonstrated. On a single property in New Jersey nearly a ton of beetles were thus collected in a single season. In the heavily infested areas, however, such trapping is of little value if conducted only in isolated places and if not generally adopted as a means of control. The placing of numbers of traps on individual properties may indeed have the unfortunate effect of attracting enormous numbers of beetles to such properties from adjacent land. This objection, however, does not apply to cases of infestation confined in an isolated area. A description of the Japanese beetle trap is given on page 119 of the Bulletin for July, 1929.