able that the ants first acquired the habit in the case of the underground species like the corn root-aphis. The oviparous females of this form wander through the galleries of the formicary, occasionally extruding an egg and then die. Of course any suggestions as to how the first eggs came to be carried through the winter can only be speculative. It apparently is not impossible that the ants noticed some quality about the eggs as they were first extruded which led them to recognize them as a part of their food-giving pets; or possibly the first eggs were overlooked and allowed to pass the winter where the mother aphid deposited them, and been discovered in spring at the time the aphides were hatching; or the eggs may have been first stored up for food, and the surplus left over in spring have hatched. However the habit may have originated it evidently is so useful to all it would be fostered. Having once become an established routine of the ants' yearly cycle, it is not difficult to imagine that they would recognize the eggs of aphides living above ground, especially those living in covered outside tunnels of the ants, and thus gradually develop the habit of carrying the eggs in and the resulting young out.

Passing now for a moment to the group of aphides whose hibernating condition is exemplified by the Woolly Aphis of the alder (p. 359) it is easy to see how natural elimination may have brought about the existing conditions. This species appears never to develop any eggs: consequently it must pass the winter in some living stage. The colonies of viviparous forms are constantly bringing forth multitudes of living young which of course are more abundant in autumn than at any other season. The crowding produced by numbers would often compel them to wander over all parts of the shrub. Those reaching late in autumn the bases of the main stems would stand a much better chance of surviving the effects of wind, snow, rain and ice than those on other parts of the tree. This constant elimination of the unfit and the 'inherited memory' of the fit would lead to present conditions.

OVIPOSITION AND HATCHING OF THANAOS JUVENALIS.

May 16, 1894, I followed a specimen of T. juvenalis which was apparently searching for a food plant among the scrub oaks of Middlesex Fells at Malden, Mass. The insect flew down to the base of a small, six-inch seedling of Quercus alba and laid a single egg upon the stem of the plant, an inch from the ground, among the tender, reddish, scale-like leaves. The act of oviposition lasted about ten seconds, during which the insect's wings were folded back to back, her fore-feet grasping the stem, while the mid- and hind-feet were rubbed quickly together and along the sides of the abdomen, appearing to assist the process of egg-laying. This occurred on a warm, sunny day, an hour before noon. The egg, delicately greenish when laid, soon became white and within twenty hours was orange in color. Seen
laterally, it was well-rounded, broadest just above the little-flattened base, with low, longitudinal, raised ribs connected by delicate, transverse ridges. The longitudinal ribs were sixteen in number, of which four pairs, each consisting of two ribs uniting near the summit at a sharp angle, enclosed within the four loops thus formed from one to three shorter ribs. Diameter, 1.27 mm. Nine days after deposition the egg began to hatch, one rainy forenoon, having become darker and finally of a brassy color, the shell being transparent between the ribs. The larva intermittently gnawed an opening at the micropyle, then started a second hole which at length coalesced with the first one. Although the aperture thus formed was large enough, the larva did not emerge but began two more openings on the side of the egg-shell. The shell had become shrunked and distorted, meanwhile. I watched the progress of hatching, or rather, lack of progress, for two days, at intervals. The caterpillar’s method of work was to eat for ten minutes and then to rest for forty-five, and when I made investigations during an unusually long rest, I found that the larva had died.

At Prospect Hill, Waltham, Mass., June 10, 1894, I enclosed a suspicious acting *T. juvenalis* alive in a small pasteboard box in which she soon laid a single egg, the hatching of which I did not witness, however. This female also had been fluttering about seedling white-oaks in an inquisitive way.

_Festus W. Folsom._

**Notes.**—A new monthly journal of entomology has appeared in Tokyo, Japan, under the title Konchū Gaku Zasshi, or Journal of Insect Science. The first number was issued in October last and is wholly in Japanese excepting an English title and the statement that the plate represents insects injurious to rice and mulberry.

In the Kansas University Quarterly for January, W. A. Snow gives a list of N. A. Asilidae supplementary to Osten Sacken’s Catalogue.
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