

GENERAL HABITS.

In habits the *Ipidæ* of our fauna form a sharply isolated group. Their tunnels, cut usually in the bark or wood of trees, are characteristic of the family. Our species present two quite distinctive habits, corresponding to which they have been termed True Bark-beetles and Ambrosia-beetles, respectively. The former, with very few exceptions, cut their tunnels entirely or almost entirely in the bark or between the bark and the wood; the latter, on the other hand, penetrate the wood and the young develop in the tunnels well below the wood surface, nourished entirely by a peculiar fungus called Ambrosia, which grows invariably upon the tunnel walls and stains them dark brown or black.

With True Bark-beetles the typical habit is as follows: An entrance tunnel is cut obliquely upward through the bark to the wood surface. From the base or inner end of the entrance tunnel one or two or more egg-tunnels are cut, vertically, transversely, or in a radiate fashion, between the bark and the wood along the wood surface. With many species a small, flat cavity, the nuptial chamber, is excavated at the base of the entrance hole, and from it the egg-tunnels originate. The eggs are laid along the sides of the egg-tunnels, singly in cup-shaped egg-niches, a few together in larger egg-pockets, or many in layers and egg-grooves. The egg-tunnels and entrance hole are uniform in size, slightly larger than the diameter of the beetle, and perfectly cylindric. The larvæ excavate slender mines through the inner bark or between the bark and sapwood, away from the egg-tunnels. The larval mines are filled with excrement and increase gradually in diameter as the larvæ grow. With some species the mines are kept regularly spaced, rarely intercrossing unless crowded, and present a regular and pleasing pattern; such are those of *Chramesus icorice* Lec., (Pl. 23, fig. 5) in hickory twigs, and *Leperisinus aculeatus* Say in ash (Pl. 5, fig. 8). With other species the larval mines are quite irregular and when numerous reduce the inner bark entirely to powder. The ends of the mines are widened to form a more or less distinct pupal cell, which may lie between the bark and the wood, may be continued into the middle layers of bark, or may be sunken below the wood surface, according to the species habit. The adult beetles finally bore round holes through the bark and escape. The result of this excavation by adults and larvæ is a set of egg-tunnels and larval-mines, characteristic of the family, frequently of the genus, and commonly of the individual species.

The tunnels of the ambrosia-beetles are discussed briefly on the following pages. They will not be confused with those cut by any other beetles of our fauna. A distinctive character is the blackening of the tunnel walls by the ambrosia fungus. The larval tunnels of *Hylecætus* are somewhat similar and are also lined with a fungus, but they are not similarly discoloured. The tunnels of *Stenocelis* might be mistaken for those of ambrosia-beetles, but there is no staining from fungi, and the larvæ tunnel freely in the wood.

ABERRANT HABITS.

The tunnels of a few of our species of *Pityophthorus*, notably *ramiperda* and *puberulus*, cut their tunnels through the pith of pine twigs (Pl. 4, fig. 5). Several species of *Conophthorus* excavate egg-tunnels through the pith of pine cones (Pl. 8, fig. 5). *Hylastinus obscurus* Marsh. makes normal egg-tunnels in clover roots. A species of *Pityophthorus* cuts the egg-tunnels immediately below the wood surface of dry maple twigs, and both adults and larvæ feed upon the black wood fungi which abound in sapwood of the twigs they select. Exotic species are found in various nuts, date pits, nutmegs, jalap root, and dry twigs. Species of *Xylocleptes* breed in plants of the gourd family. Several ambrosia-beetles are recorded cutting their tunnels in the staves of wine casks