and in similar places. Aberrant habits are much more common in tropical countries than with us. The vast majority of our species breed normally in the bark or wood of trees.

Details of the Tunnels.

A study of the egg-tunnels and larval-mines reveals many important and interesting characters. A distinctive form of the galleries obtains with many species, so that an examination of the tunnels in the bark or wood may determine exactly the species to which they belong. It is thus possible to determine which species have been working in a tree, even years after the beetles have left, and if the galleries were engraved upon the wood, even after the bark has disappeared. The work of *Chramesus icoriæ* Lec. in hickory branches (Pl. 23, fig. 5), of *Leperisinus aculeatus* Say in ash (Pl. 20, fig. 2), of *Eccoptogaster piceæ* Sw. in spruce and fir (Pl. 20, fig. 3), of *E. rugulosus* Ratz. in fruit trees and wild cherry (Pl. 5, fig. 7), of *Phloeosinus canadensis* Sw. in eastern cedar (Pl. 5, fig. 5), of *Dryocoetes confusus* Sw. in mountain balsam (Pl. 19, fig. 1), and many others, may be specificially determined, even though, as rarely happens, no old dead beetles are to be found in the bark.

The Entrance-hole.

The entrance-hole with most species is usually free from chips or frass except while this material is being extruded; but with certain other species there are peculiar characters connected with it. The boring-dust and excrement of *Xyloterinus politus* Say projects from the entrance-hole while excavation is active, often for several centimetres, as a cylindric rod of the diameter of the entrance-hole. During a period of fine weather these are often visible in great numbers on the trunks and limbs of dying, infested maples and beeches. The entrance-holes of *T. retusus* Lec., on the other hand, are readily distinguished by quite different characters. The opening is covered by a cup-like layer, an aggregation of excrement. Through a small hole in the centre of this cup, which is convex outwards, a slender thread of excrement projects, pushed out by additions from within, until finally broken by rain or by the action of gravity. The air circulation in tunnels so blocked at the entrance must be extremely slow. The borings of *Eccoptogaster rugulosus* Ratz. and *Phthorophloeus liminaris* Harris in green bark of peach trees and wild cherry trees result in a copious exudation of sap, and the hardening of the sap produces conspicuous gummy masses about the entrance-holes. The flow of resin from the tunnels of certain species of *Dendroctonus, Ips,* and others, in green bark of pines and spruces, results in a "pitch-tube" or "resin-tube" about the entrance-hole. The beetles are able to live in spite of the exuding resin, and by their movements backward and forward in the ejection of the boring-dust, form the surrounding tower of gum upon the bark. The presence of this "resin-tube" about the entrance-hole proves that the tunnel was started in fresh, sappy bark.

With many species of Ipid beetles the male spends part of his time backed into the entrance tunnel near the opening, which he neatly fits, and through which his declivity is often visible. In species whose males are wingless, and therefore have no part in the construction of new tunnels, the female adopts this function of guarding the entrance, in addition to her other regular duties. With a few species, like *Chramesus icoriæ* Lec., one or other of the parent adults dies in the entrance-hole, and thus prevents the intrusion of later enemies. This closing of the entrance-hole for a considerable part of the time guards in a measure from predacious and parasitic enemies, and checks evaporation from the tunnel walls.