

many cut them between the bark and the wood, the pupal-chambers being merely an enlargement of the ends of the larval-mines; others form the pupal-chamber by driving the ends of the larval-mines a half inch or less vertically into the wood, some even cutting the distal half of the larval-mines just below the wood surface: and lastly, a very few small species cut almost the entire system of tunnels and mines slightly below and parallel to the surface of the wood. The Twig-beetles cut both tunnels and mines, when the latter are present, through the wood and pith of twigs. Among the Ambrosia-beetles the tunnels are in all species entirely within the wood, but the depth to which they enter varies considerably with the species. In the genera *Corthylus*, *Pterocyclon*, *Trypodendron* and *Gnathotricus* the eggs are laid in niches along the sides of the tunnels, and the larvæ cut very short mines, known as cradles. The species of *Platypus* lay the eggs free in the tunnels, but the larvæ when nearly ready to pupate cut short cradles in which they pupate and remain until mature. In the genus *Xyleborus* the eggs are laid free within the tunnels, but the larvæ cut no cradles, pupating in the primary tunnels. There is thus a fairly well-marked gradation in habit, both as to the depth of the tunnels and mines below the surface and as to the degree of development of the larval mines.

The fourth group contains those species not included among the Bark-beetles, Ambrosia-beetles and Twig-beetles. The American species are few in number. *Coccotrypes dactyliperda*, an imported form, burrows in date seeds; *Cryphalus jalappæ* is found in jalap root; *Hypothenemus eruditus* burrows in nuts, book-bindings, and other dry substances, as well as in dead twigs of grape and orange; *Pityophthorus coniperda* occurs in pine cones; *Hylastinus obscurus* bores in the roots of clover; and *Cactopinus hubbardi* in the pith of the giant cactus.

*Enemies of the Scolytidæ.*—The Scolytids have many natural enemies. They are preyed upon by many predaceous and parasitic insects, by birds, and are frequently attacked by fungous diseases.

Adults and larvæ belonging to the families Cleridæ, Staphylinidæ, Colydiidæ, Histeridæ and others enter the burrows and feed upon the eggs, larvæ, pupæ and adults of the Scolytids. The predaceous larvæ often burrow through the larval-mines after the Scolytid larvæ, which they finally overtake and devour. Various dipterous larvæ feed upon the eggs and younger stages. Many small hymenopterous parasites prey upon the larvæ and pupæ, and have even been bred from the adults. Larvæ of large wood-boring beetles, such as *Monohammus*, destroy the Scolytid tunnels by their borings and prove serious enemies to the beetles.