

the sugar-cane; *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 hymenopterous parasites, Braconids, Chalcids and Proctotrypids, prey upon the larvæ and pupæ, and have even been bred by Dr. Hopkins from the adults, the parasite emerging through a hole cut in the elytra. Larvæ of large wood-boring beetles, such as *Monohammus*, destroy the Scolytid tunnels and prove serious enemies to the beetles. Woodpeckers destroy large numbers of the Bark-beetles, but apparently do little to check their ravages.

The tunnels, especially of the Timber-beetles, are frequently overrun with various species of mites. The eggs of these mites hatch before the young beetles are ready for their flight, and in this way young and adult mites are carried by the beetles to the new tunnels. At certain times the declivity of the elytra of various species of *Ips* (*Tomicus*) will be found covered with minute mites, and *Pterocyclon mali* and *P. fasciatum* are frequently almost completely covered with them upon emerging from their tunnels in the spring.

Fungous diseases are sometimes very injurious. All stages of the insects are frequently found, more particularly in wet weather, filled and covered with the white mycelium of the fungus. In a felled pine log I noticed that hundreds of adult *Ips pini* had died from this cause in less than two weeks.

*Friends of the Scolytidæ.*—As these beetles feed mainly upon dying and dead branches and trunks of trees, any cause which tends to weaken or destroy the trees aids the Scolytids in supplying the proper food-plant. Heavy storms, forest fires, other insects, and the destructive work of man, are perhaps the chief of these.

*Economic Importance.*—Owing to the destructive habits of many of its members, the family Scolytidæ is of considerable economic importance. The injury done by these beetles may take two forms: living trees may be weakened and killed, and standing and felled timber and sawn lumber may be rendered useless for many purposes by the tunnels of the beetles.

But few Scolytids attack living, healthy trees, although there are a few species which apparently choose only trees in this condition. The