

S. (All hands up.) There is a constant roar of sounds going on in every direction without a single stop.

T. Is that the way you talk of the autumnal concert of the orthoptera?

S. Is all the sound made by the locusts?

T. By no means. I said orthoptera. How do you know that the locust is an orthopter?

S. By its straight wing covers.

T. Well, that is one point. Examine the flying wings. Raise first the wing covers at right angles to the body, then expand the under wings.

S. The flying wings are folded up like a fan. They are nearly transparent, with a greenish tint near the body, and are netted with fine brown lines.

T. Has any scholar a different kind?

S. This locust is over an inch and a half long, is of a dark ash brown color, with dusky spots, and its flying wings, when expanded, are black, with a yellow border. When it flies in the hot sun it makes a rustling noise.

T. Very good. You have captured the *Carolina Locust*. There are several species of them. Some are remarkable for the crackling, snapping noise they make when flying by means of the edges of their wings against their wing covers. The locusts form only one family of the orthoptera. The second family is properly called the *grasshoppers*.

S. How would you know them?

T. Find one first. I may tell you, however, that they are mostly of a grass-green color, with antennæ longer than their bodies. (The antennæ of the locusts are always shorter than their bodies.) They have four joints in their feet; (the locusts only three). Their wing covers are not so roof-like in position as in the locust.

S. Oh, yes. I caught one on a bush, while it was singing, *zeep, zeep, zeep*—fiddling, I suppose.

T. Fiddling, or harping; shrilling is the proper term. The insect raises its wing covers and appears to scratch their bases against each other when producing the sound. Some of these tree or shrub grasshoppers are called *Katydid*s, from the stridulation or shrilling noise made by the male.

"I sit among the leaves here when evening zephyrs sigh,
And those that listen to my voice, I love to mystify;
I never tell them all I know, altho' I'm often bid,
I laugh at curiosity, and chirrup, 'Katy-did.'"

T. But there is a third family, the *crickets*.

S. We have one about our chimney, and it makes a very shrill noise.

T. That is the *domestic cricket*. It came over from the old country with our forefathers. The *shrilling* is done by the male. He raises the fore wings or covers and rubs a prominent vein in them, which is covered with very fine teeth, over the sur-

face of the under wings. These wings and their veins are as elastic and sonorous as a little drum, hence the loudness of the sound.

S. There are lots of large crickets, and smaller ones, everywhere in the fields.

T. Very good. The large black one is called the *neglected cricket*, by the entomologists. There is also a common and rather mischievous white cricket, called the *showy cricket*, which young people might mistake for a kind of moth. It injures some useful plants by boring into the twigs to deposit its eggs in the central pith.

I will mention a fourth family, the *cockroaches*. These are the more important. An *ear-wig*, and a *spectre* or *walking-stick*, belonging to a fifth and sixth family, respectively, are known to be in this country.

S. How many species of each different family of the orthoptera are known to be in Canada? I suppose each kind takes up a different part in the autumn open-air field concert?

T. Over 40 different species of locusts; 11 grasshoppers; 8 crickets; 6 cockroaches; 1 spectre, and 1 ear-wig. Let us see how many different kinds we can find in our school section.

S. Are there a *larva* and *pupa* stage in the orthoptera?

T. There are; but both the *larva* and *pupa* are very much like the *imago*, only smaller, and without the fully developed wings. They do not change their forms so completely as nearly all the other classes of insects do.

I will read you some other day something about the work of the *Hateful Locust*.

THE HATEFUL LOCUST.

Prof. Riley, the leading entomologist of the United States, thus describes the manner in which it lays its eggs. The figure at the beginning of the Ferndale lesson represents the different positions. "The female when about to lay her eggs, forces a hole in the ground by means of the two horny valves which open and shut at the tip of her abdomen, and which, from their peculiar structure, are admirably fitted for the purpose. With the valves closed she pushes the tips in the ground, and by a series of muscular efforts and the continued opening and shutting of the valves, she drills a hole until, in a few minutes (the time varying with the nature of the soil) the whole abdomen is buried, the tips reaching an inch or more below the surface by means of great distention. Now, with hind legs hoisted straight above the back she commences ovipositing, the eggs being voided in a pale, glistening and glutinous fluid which holds them together and binds them into a long, cylindrical