Entomology.

Insects of Early Spring.

DURING the unusually warm balmy days of March this year, a few insects were tempted to come out of their snug winter-quarters for a little while, thinking perhaps that grim winter had done its work, and that the joyous spring was at hand. But if such were their thoughts, they were doomed to a speedy and grievous disappointment; the return of frost and snow must soon have made them hurry back to the holes they had left, and cower away till the biting wind and cold should be passed, and genuine spring be come again. Among those tempted out thus early, we found specimens of one of the fire-fly tribe of beetles (*Ellychnia corusca*); several of the large lazy-looking beetles that live under bark (*Ipthenus Pensylvanicus*); a squash-bug (*Coreus tristis*); quantities of house-flies, a few honey-bees, one or two smoky-winged wasps, and—earlier than all—swarms of the common snow-fly, that usually comes out during the first mild days in the end of February, but this year did not appear till March the 8th: these are Neuropterous insects, apparently the *Perla Nivicola* of Fitch (*Capnia pygmœa*, Burn).

While we are writing it is still cold weather, but before this reaches the eyes of our readers it will probably be warm and genial again; then we shall expect to find the insect world beginning to bestir itself in earnest. When the willow catkins come out the big humble-bees and their lesser cousins, various species of wild-bees, will come out; wasps will begin their spring work; the Tiger-beetles will forage briskly over warm sunny knolls and dry sand; many insect-eating ground-beetles will be found under stones waiting for nightfall to begin their useful work; and a few gay butterflies may here and there be seen opening and shutting their broad wings to the warm rays of the sun.

Now is the time for the gardener to look sharply after h s fruit-trees; all loose bark should be scraped off and the scabs that cover the eggs of the bark-lice rubbed away. Search should be made for the eggs of the tent caterpillar, which form rings or bracelets round the twigs, and all withered leaves that remain on the tree should be examined, for they generally contain the empty cocoon of the *Orgyia* apple-moth, on which the wingless female lays her mass of froth-covered eggs. Any straw or matting, loose boards or other rubbish at the base of fruit-trees, should be turned over and examined; such places often shelter the cocoons of the coddling-moth, and caterpillars, and insects of various kinds. Any insects that seem strange, or about which information is desired, we trust will be sent to us for inspection.

The Head of an Insect.

IN the higher orders of animals, while the internal anatomy is wonderfully complicated, the outward appearance is comparatively simple and plain; all the works of the intricately constructed machine are concealed from view, a few primary organs only being apparent to the sight. In insects the case is just the reverse. The internal organs are few in number and simple in construction; while the external parts are particularly numerous, and marvellously varied to suit the special ends of the almost infinite number of differing species. To the student of Entomology this is a magnificent advantage, as with the aid of a magnifier he is enabled to observe and note most of the various parts, or trace out their special uses, without having to resort to the dissection of the object. The great majority are on the surface, and if we give them a little careful examination and patient study we shall soon learn a great deal about them.

When we look at the head of a quadruped, we see that it is very small compared with the rest of the body, and that it exhibits only a pair of eyes and nostrils, a mouth, ears, and sometimes horns or tusks. A bird's head, again, displays still less, little more being seen than a pair of eyes and a beak. But take up an insect and examine its head with a lens, or if a large specimen, even with the naked eye, and what a complicated structure do you behold! Eyes there are, big and little; antennæ or horns, mouth with jaws above and jaws below, pairs of feelers or palpi, perhaps a sucker, or possibly a set of lancets; instruments for observation, instruments of defence, instruments for taking food, all grouped together in a very small space, and constructed in the most wonderful variety of ways. Compare a few insects of different orders together, and the wonder is still greater. Look at the head of the large Pine-borer beetle, with its powerful jaws and antennæ twice the length of its body, then at the Dragon-fly with its scarcely perceptible antennæ, but with eyes that almost surround it; look again at a large Hawk-moth, with its beautiful feather-like antennæ, and its coiled up sucker that will unroll to more than the length of its great body; now turn to a grasshopper, a fly, or a bug, and see what a change—what a variation of organs is to be seen! To recount all these differences of form, structure, size, colour, clothing, etc., would occupy volumes, without even saying a word about their objects and offices. We must be content, then, with considering the organs as they are common to all, and only observe, for the present, the variations that distinguish the several grand orders of insects, leaving out of sight the minor differences that are peculiar to species, genera, or even families.

The *Head* of an insect—to come to particulars—is a hard, somewhat rounded skull; having an opening in front for the mouth and its group of organs. On each side it has a fixed, immovable eye, of large size and complex structure, between which are sometimes two, or often three, tiny little eyes, each consisting of a single lens. Close to the large eyes are two moveable jointed organs, called antennæ, of endless variety of form, size and structure, and whose exact uses have long been a puzzle to naturalists. The front part of the head is often separated by a seam from the rest of the skull (especially in Beetles), and is then called the *Clypeus* or shield; this part often bears a horn or knobs. The under surface of the head is called the throat, and is divided into various parts, each with its particular name, in the different orders of insects. The head is connected behind with the thorax, sometimes by a very slender neck, sometimes by a barely perceptible division.

The *organs of the mouth*, though varying very much in form, are yet constructed on one principle. They consist of six principal organs, two on each side of the opening, one above, and one below. The upper one is the upper lip (*labrum*); the lower the under lip: the upper pair of side organs are the upper jaws or *mandibles;* the lower pair the *maxillæ* or lower jaws. Each of the lower jaws has attached to it one, or two, jointed organs or feelers, called *palpi*, and the under lip has also a pair of these feelers. The jaws, it should be noticed, move sideways, not up and down. There are two principal modes in which the food-obtaining organs are employed, the operation of which is vastly different, and causes an enormous change in form and structure. When the side pieces of the mouth are short, apart from each other, and have a horizontal motion, the action produced is *biting*, as in a beetle; but when these side pieces are elongated, close to each other, and have a longitudinal motion, the action produced is *sucking*, as in a butterfly. According to these modes of action, insects are divided into two grand classes, called in English, *Biting Insects* and *Suctorial Insects;* any classification based upon this difference, must, however, be confined to insects in their perfect form, since caterpillars, for instance, have jaws for biting, which are transformed into a spiral sucking-tube when the insect becomes a moth or butter fly.

In *Biting Insects* the upper lip is a flat plate closing the mouth above; the upper pair of jaws or mandibles are of a hard, horny consistency, and are furnished with teeth for biting and gnawing the food; these teeth are portions of the jaw itself, not separate in any way. The lower pair of jaws, or maxillæ, are modified in many ways which it would be tedious to particularize here; and the lower lip is still more complicated, and subject to great variations. In bees, the lower jaws and lip form together a sucking apparatus, while the form of the upper biting jaws causes them to be included among the biting insects.

In *Suctorial Insects* there is a wonderful diversity of structure, Bugs, for instance, have the two pairs of side-pieces lengthened out into slender lancet-like organs for piercing, the whole being enclosed in the fleshy elongated lower lip, which acts as a sucker. In Flies, also, the five upper organs are turned into lancets sheathed in the fleshy sucker of the lower lip; this structure is especially seen in the fierce, blood-thirsty Horse-fly (*Tabanus*); in the common House-flies the lancets are wanting. In Butterflies and Moths the lower jaws are greatly elongated into a delicate instrument for sucking, which is coiled up and hidden from sight when the insect is at rest, but is thrust out and extended to the bottom of long-throated flowers when in action. In all these cases the palpi, or mouth-feelers, also are variously modified. The other organs of the mouth about which we desire to speak in particular are the antennæ, and the different kinds of eyes; these, however, we must defer for another occasion.

The Household.

BURNING COAL OIL IN BED-ROOMS.—The practice of burning coal oil in lamps in bed-rooms, through the night, is a very pernicious and dangerous one. The gas generated by the lamp is of a poisonous nature, and exceedingly detrimental to health, affecting the lungs very seriously. If the lamp is allowed to burn as when in common use, the gas is nearly all consumed in the chimney, but when the wick is turned down so as to give a dim light in the room, the gas generated is not consumed, but escapes into the room. If the windows and doors of the apartment are tightly closed, as is generally the case in the winter season, the occupants cannot escape the injurious effects. If it is necessary to keep a light burning, let the wick be kept fully up.

PRESERVING MEAT FRESH.—Professor Gamgee has invented and tested a new method of preserving meat, which promises to be efficacious, and to be the means of increasing the supply of cheap animal food for the dense populations of the larger cities. The process is as follows:—A close bag containing carbonic oxide gas is thrown over the head of the animal to be slaughtered, when partial asphyxia quickly ensues. The animal is then bled to death. The body is immediately afterwards hastily dressed; and while still warm, the parts to be preserved are placed in an air-tight iron case, and treated with carbonic oxide and sulphurous acid, which penetrate the flesh, and arrest fermentation and decomposition. It is said that the meat is thus preserved perfectly fresh and contracts no unpleasant flavour. The method is adapted to warm climates.

CURIOUS EFFECT OF THE COST OF FUEL ON THE PRICE OF MEAT IN FRANCE.—The following scrap is obligingly furnished by a frequent contributor. A correspondent from the French Exhibition writes:—"When I was at the Paris Exhibition the other day, I asked a well-known and very good *restaurateur* what was the relative price, in the Paris market, of the different joints of mutton. I asked 'What is the prime joint?' He said, 'The prime joint, beyond all comparison, is the neck.' I asked, 'What is the next joint?' and he said, 'The loin.' I said, 'What is your lowest priced joint?' He said, 'The leg,'—adding that when the leg of mutton was priced at six pence per lb. the neck was priced at from one shilling to one shilling and two pence per lb. I said, 'You are clearing my sight very much—you are opening a new vista to me.' The fact is, the small cutlet and the large cutlet, that is to say, the neck and the loin, require very little fuel to cook them, whereas the leg of mutton requires a great deal of fuel. On the continent of Europe fuel is very dear, and therefore the joints vary in price according to the value of the fuel, consequently you will there find necks and loins dear, and legs cheap."

This, if true, is very curious. We all know that economy both in meat and fuel is in France carried to extremes; they reckon both meat and fuel by the ounce; and if they can get their "*pot au feu*" (that is to say—a hot dish) cooked three times a week, it is as much as the ordinary artizan can hope to afford. We in Canada have great cause to be thankful that both meat and fuel are attainable in our families on a more liberal scale.

ORIGIN OF THE TERM PERFUME.—The first perfumes were obtained by a combustion of aromatic woods and gums (hence the name *per fumum*, "through smoke") and the first use primitive nations made of them was to offer them on the altars erected to their gods, perhaps with the mystic idea that their prayers would reach them sooner wafted on the blue wreaths of smoke, or for the less poetic purpose of counteracting the smell of the flesh burned in their sacrifices. Modern incense derives its sweet balsamic smell from benzoin (*Styrax benzoin*), which also forms one of the chief ingredients in pastiles and fumigating powders. —*Rimmel on Flowers and their Uses.*