

The cray-fish is a small fresh-water lobster found in most of our streams and rivers, while the wood-louse is the familiar sow-bug found under rotting wood, old boards and similar places. The insecteans differ from the crustaceans in generally having but a slight external skeleton, as in the house-fly, spiders, moths, butterflies, etc. They also differ in other particulars. *The honey-bee is an insectean.* This group is again sub-divided into three sections—the myriapoda, the spiders, and the true insects. The myriapoda comprise all those insecteans, which have a great number of legs, as centipedes, galley-worms and others. Spiders have a body constricted in the middle, they have four pairs of legs, and no wings, while the true insects have bodies consisting of three divisions, head, thorax, and abdomen. They have three pairs of wings, all borne on the thorax. They breathe through the tubes or tracheæ, which, opening externally under the wings, ramify to every portion of the body. *Bees are true insects.*

The class of insects being very large it is convenient, and indeed necessary, to subdivide them into a number of orders, or tribes, the principal of which are the *Coleoptera*, or "beetles," distinguished by the hard exterior of the insect. This is the largest order. The *Lepidoptera* comprises the butterflies and moths. The *Diptera*, insects having but one pair of wings, as the house-fly, horse-fly, gnats, etc. *Neuroptera* have wings delicately "nerved," as is seen in the wings of the dragon-flies, may-flies, etc. The *Orthoptera* are distinguished by the possession of straight wings, when at rest, folded like a ladies' fan. Grasshoppers and crickets belong here. The *Hymenoptera* are the insects with delicate membranous wings. This is a very large order, and includes the honey-bees, bumble-bees, carpenter bees, mason bees, wasps, ants, hornets, yellow-jackets, saw-flies, etc. The members of this order all exhibit a high degree of intelligence in the way in which they care for their young, and in storing up provisions for future use. They probably stand at the head of insects. *Honey-bees are hymenopters.*

In natural history, orders are sub-divided into families. The family of the honey-bee is commonly known by the name *Apideæ*, and includes all the hymenopterous insects which feed their young upon pollen, or pollen and honey. All the insects of this family have broad heads, elbowed antennæ, thirteen jointed in males, but twelve jointed in females. The jaws are strong and the tongue generally long. They also have a "tibial spur" on the four anterior legs. The first joint of the posterior foot is flattened to form the "pollen basket." The larvæ are all helpless maggots which must be carefully reared and nursed by the mature bees.

Besides the true honey-bee, there belong to the family *Apideæ* the bumble bee so well known to every country boy. These build their nests in hollows in the ground, along fence rows, or under old stumps, using, I think, the abandoned nests of field mice. Of these bees only the queen survives the winter. The carpenter bees, so common in the spring of the year about frame buildings and fences, belong here. They look much like the bumble, and are often quite destructive to buildings from their extensive borings. There are also bees called mason bees, which construct cells of mud, sometimes in the ground, and in

some species in hollow plants and similar places. Some years ago I saw a large number of these bees working into the mud chimney of a cabin. They were so numerous that I thought a swarm of honey-bees were present, but on closer inspection I saw bees closely resembling the honey-bee boring into the clay by first softening it by means of spittle which they abundantly secreted. There is also a bee called the tailor bee, which constructs very curious cells from pieces of leaves which it cuts from various plants, oftentimes of the rose and Virginian creeper. Sometimes the flower leaves of the rose are employed for this purpose. There are several species of bees that lay their eggs in the nests of other bees; with us, preferably of the bumble-bee. The young bees are then reared by the foster-parents, as the young of some species of birds are. There are also several species of bees which are destitute of stings, known in tropical countries, which are honey and wax gatherers; but they have never yet been domesticated and found of value to man.

Families are subdivided into *Genera*. This is a term which has long puzzled naturalists to define; but, for our purpose, we may say it is a branch of a family which always reproduces its kind. It is only animals of the same genera which, by sexual union, can produce fertile offspring. Every genus reproduces true to itself. The genus name of the honey-bee is *Apis*, and this group includes all bees which gather honey and store it in combs, and all of which are domesticated to some extent, or seem capable of domestication. *Genera* are subdivided into *species*, and *species* again into *varieties*. The species of our common honey-bee is *mellifica* and its full name, as known to naturalists, is *Apis mellifica*. The number of species of honey-bees is not well established, but the following have all been described—viz:—*Apis mellifica*, *Apis dorsata*, *Apis Indica*, *Apis zonata*, *Apis florea*, *Apis Adansonii*, *Apis nigrocincta*, *Apis unicolor*.

It is an interesting fact that these all are natives of the Eastern Hemisphere. No true honey bee seems to have been a native of America on the advent of Europeans. The exact period of their introduction is now unknown; but it is well authenticated that all the "wild bees" are escaped from domestication, and their spread over the continent has been noted by many observers. By the Indians they were known as "the white men's flies." Besides the common honey-bee (*Apis mellifica*), the only other species of much present interest, is the *Apis dorsata* of India, Sumatra, Borneo, etc. They are larger than the common bee, and build their combs in the tops of high trees. These combs have been seen four feet wide by six long. These bees have been imported into Europe at a great expense, but so far haven't been profitably domesticated. It is a curious fact that the drones of this species fly at night only.

Varieties in natural history are forms which are readily produced in many species of both animals and plants, by varying the food, climate, or care of the individuals operated upon; thus probably all the diverse forms of horses, cows, sheep, dogs, chickens, etc., etc., have been derived from one species of horse, cow, sheep, dog, chicken, etc. Many varieties have been produced through the operation of natural causes, as many of the varied forms of dogs, and of other animals.