

### How to Collect Insects

A correspondent (A. B. B., of Bayfield, Ont.) has sent us a short article on collecting and preserving specimens of insects, which is very good as far as it goes, but as he does not appear to be conversant with the most approved methods usually adopted by entomologists, we have thought it preferable to give some brief directions ourselves. As the world of insects is divided into a number of departments, or orders, the members of which differ very much from each other in structure and modes of life, it is impossible to give directions that will apply to all without exception; we shall therefore take up the principal orders in detail.

**BUTTERFLIES AND MOTHS** (*Lepidoptera*) are generally the first sought after by collectors, on account of their conspicuous size and beauty. The chief implement required for their capture is a *ring net*, by which they may be taken on the wing, and as they hover over or alight upon flowers, leaves, etc. This is usually made of book-muslin or coarse tartan in the form of a bag, narrowed slightly towards the bottom, and with a strong hem of calico to receive the ring; a very useful size is thirty inches deep, with a diameter at the top of fifteen inches. The ring may be made of cane, or thick iron or brass wire, the ends of which fit into a Y-shaped tin or brass ferrule; the two branches of the ferrule should receive the ends of the ring tightly, while the other part—the stem of the Y—is made large enough to fit the end of a walking-stick, or other convenient rod, three or four feet long. Nets can be purchased with a jointed ring for convenience of packing, and with various contrivances for fitting the end of a rod; one made as we have described will be found, however, to answer quite as well as one of more elaborate structure.

When a specimen has been secured in the net, by throwing the bottom over the ring,—the requisite dexterity for performing this achievement is very soon acquired by a little practice—the next question is, what are you to do with him? How are you to secure him without damage, for the scales that cover his wings and body rub off very easily? There are several ways of doing this. If the specimen is a butterfly, seize the net with the left hand so as to prevent his fluttering as much as possible, and then give the thorax, under the wings, a strong continuous pinch with the thumb and fore-finger of the right hand, which will speedily deprive him of life. *Be sure never to take hold of a butterfly or moth by the wings*; if you do, its value as a specimen is ruined, and it had infinitely better have been left to enjoy its little lease of life and happiness undisturbed. Should the specimen be a moth, secure it from fluttering, as much as possible, and touch its head, through the net, with a drop of chloroform, which may be conveyed on the glass stopper of the bottle that contains it; a single drop will instantly put an end to all fluttering, though the crea-

ture will soon revive if let alone. To destroy its life various poisons may be employed—due care being, of course, taken to guard against accidents; we prefer ourselves a further application of chloroform, as being the quickest, clearest, and easiest agent to employ. Some, however, use a solution of oxalic acid, or of cyanide of potassium, (both deadly poisons,) which they introduce into the body of the insect by means of a pointed quill or steel-pen dipped into the solution, and inserted into the side of the thorax beneath the wings. A wide-mouthed bottle with a little cyanide of potassium secured at the bottom by a piece of perforated card, or a few drops of strong ammonia or chloroform on a bit of sponge, will be found a very useful and effective killing apparatus, half an hour's exposure to its deadly fumes will put a painless end to the life of the strongest moth. Butterflies may be killed in the same way, and with less injury than by the pinching process, which is only mentioned on account of its peculiar convenience.

When the specimen has been effectually deprived of life, the next business is to prepare it for the cabinet. First, take an insect pin of suitable size, and thrust it for two-thirds of its length through the middle of the thorax of the specimen; then transfer it to the setting-board, and expand its wings in the manner which we are about to describe. This process should be performed as soon as possible after the death of the specimen, otherwise the wings and legs become so rigid in a few hours that it is impossible to alter their position without a further operation of relaxing. A convenient setting-board is made of smoothly-planed pine, with a longitudinal groove wide enough to receive the body of the insect; different sizes will, of course, be required to suit all descriptions of specimens. The insect is pinned in the groove in such a way that its wings can lie flat upon the surface of the board, they are then drawn out to the required expansion by means of needles inserted in little wooden handles, and kept in their places by narrow strips of glass, or braces of card pinned to the board. Care must be taken to keep the specimens during this process from dust and the attacks of insect enemies. After a few days—more or less according to the condition of the weather, and the size of the specimens—they may be removed from the setting-board to the cabinet, the body having become dry and rigid, and the wings set in the desired manner.

An insect-cabinet is a case of well-fitting shallow drawers, usually furnished with doors in front; it may be of any size, workmanship, or material desired; resinous woods, such as cedar, should, however, be avoided. The drawers should be fitted with movable glass frames, lined with sheet-cork, and neatly papered; their depth should be proportioned to the size of the pins employed. The objects of a cabinet are, to keep the specimens from light, which would soon cause them to lose their colours, and from dust; to exclude insect

depredators, and for convenience of classification and reference. Any kind of boxes however, may be employed, so long as they are tightly made, to exclude dust, and have well-fitted lids to keep out the light. Should any specimen become affected by mites or other minute pests, immerse it in benzine for a moment, being careful always to remember that this liquid is highly inflammable and explosive. When cork is too expensive for lining, or cannot be obtained conveniently, strips of pith of various woods, the stalks of Indian cork, or "inodorous felt," may be employed as tolerable substitutes.

Butterflies may be captured from early spring to late in the autumn—different species at different times—during the hours of sunlight about flowers, on muddy spots, in meadows, etc. Moths are, for the most part, nocturnal in their habits, and must, therefore, be lured to us, as we cannot see to follow them. The process called "sugaring" is very effectual for many families of moths, and may be thus employed: Mix together some coarse brown sugar and beer, adding, if possible, a little rum, and making the whole about the consistence of treacle; daub some of this, about sunset, on the trunks of trees, fence posts, palings, etc., on the margin of woods, in parks or gardens; and after dark visit the sugared places with a bull's-eye lantern. If the night be favourable, moths will continue to come for hours to the sweet repast, and may be easily captured. A warm damp evening is usually the most productive. Light may also be employed to lure "the silly moth," either through the open windows of our dwellings if in the neighbourhood of woods or gardens, or by means of a lantern suspended over a white sheet on the ground. The best means of all, however, for obtaining good specimens of both butterflies and moths is to rear them from the caterpillar state; this involves trouble, care, and attention, but the amount of knowledge of the creature's habits thus acquired well repays the student's labor, to say nothing of the value and excellence of the specimens in the end. Many small moths, we should mention, may be captured by sweeping with the net, grass, clover, etc., and by beating over it the branches of trees and shrubs, flowers, etc.

**BEES, WASPS, HORNETS, ICHNEUMONS, ETC.,** (*Hymenoptera*) may be captured, killed, pinned and set in much the same way as the foregoing; but it should be borne in mind that though they may be touched with the fingers, the hairy species must never be wet with any liquid. It is needless, we suppose, to caution the collector against any rash handling of these fierce, stinging creatures; but we may assure him that with a little care he can almost always avoid being stung. Though we have taken thousands of specimens, we have not ourselves been once stung for many years.

**BEETLES** (*Coleoptera*) may be captured with a net when flying, by sweeping in the mode already described, by beating foliage and flowers over an inverted umbrella, and espe-