DIRECTIONS FOR COLLECTING AND PRESERVING INSECTS

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A. S. PACKARD

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SMITHSONIAN MISCELLANEOUS COLLECTIONS.
261

DIRECTIONS

FOR

COLLECTING AND PRESERVING

INSECTS.

PREPARED FOR THE USE OF

THE SMITHSONIAN INSTITUTION,

BY

A. S. PACKARD, JR., M.D.

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SEPTEMBER, 1873.

ADVERTISEMENT.

In the Smithsonian Report for 1858, a paper was published on the method of collecting and preserving insects, prepared by Baron Ostensacken, of the Russian Legation, with contributions by other eminent entomologists, which has rendered valuable service in the way of awakening an interest in Entomology and in facilitating the collecting of specimens. It was, however, not stereotyped, and as the methods of gathering and preserving insects have been much improved since its date, it has been thought advisable to request Dr. Packard, as a leading authority, to furnish a new treatise on the same subject. In compliance with this request he has prepared the following pages, derived mainly from the "Guide to the Study of Insects,"* though with some additions and corrections, corresponding with the present state of our knowledge.

JOSEPH HENRY,

Secretary Smithsonian Institution.

SMITHSONIAN INSTITUTION,

Washington, September, 1873.

* Published by the Naturalists' Agency, Salem, Mass. 8vo.

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TABLE OF CONTENTS.

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GENERAL CONSIDERATIONS.

INSECTS differ sexually in that the female often appears to have one abdominal ring less (one ring disappearing during the semi-pupa state, when the ovipositor is formed), and in being larger, fuller, and duller colored than the males, while the latter often differ in sculpture and ornamentation. In collecting, whenever the two sexes are found united they should be pinned upon the same pin, the male being placed highest. When we take one sex alone we may feel sure that the other is somewhere in the vicinity; perhaps while one is flying about so as to be easily captured the other is hidden under some leaf, or resting on the trunk of some tree near by, which must be examined and every bush in the vicinity vigorously beaten by the net. Many species rare in most places have a *metropolis* where they occur in great abundance. During seasons when his favorites are especially abundant, the collector should lay up a store against years of scarcity.

At no time of the year need the entomologist rest from his labors. In the winter, under the bark of trees and in moss, he can find many species, or detect their eggs on trees, etc., which he can mark for observation in the spring when they hatch out.

He need not relax his endeavors day or night. Nothing is night employment. Skunks and toads entomologize at night. Early in the morning, at sunrise, when the dew is still on the leaves, insects are sluggish and easily taken with the hand; so at dusk, when many species are found flying; and in the night, the collector will be rewarded with many rarities, some

species flying then that hide themselves by day, while many caterpillars leave their retreats to come out and feed, when the lantern can be used with success in searching for them.

Wollaston (Entomologist's Annual, 1865) states that sandy districts, especially towards the coast, are at all times preferable to clayey ones, but the intermediate soils, such as the loamy soil of swamps and marshes, are more productive. Near the sea, insects occur most abundantly beneath pebbles and other objects in grassy spots, or else at the roots of plants. In many places, especially in alpine tracts, as we have found on the summit of Mt. Washington and in Labrador, one has to lie down and look carefully among the short herbage and in the moss for Coleoptera.

The most advantageous places for collecting are gardens and farms, the borders of woods and the banks of streams and ponds. The deep, dense forests, and open, treeless tracts are less prolific in insect life. In winter and early spring the moss on the trunks of trees, when carefully shaken over a newspaper or white cloth, reveals many beetles and Hymenoptera. In the late summer and autumn, toadstools and various fungi and rotten fruits attract many insects, and in early spring when the sap is running we have taken rare insects from the stumps of freshly cut hard-wood trees. Wollaston says, "Dead animals, partially dried bones, as well as the skins of moles and other vermin which are ordinarily hung up in fields, are magnificent traps for Coleoptera; and if any of these be placed around orchards and inclosures near at home, and be examined every morning, various species of *Nitidulæ*, *Silphidæ*, and other insects of similar habits, are certain to be enticed and captured.

"Planks and chippings of wood may be likewise employed as successful agents in alluring a vast number of species which might otherwise escape our notice, and if these be laid down in grassy places, and carefully inverted every now and then with as little violence as possible, many insects will be found adhering beneath them, especially after dewy nights and in showery weather. Nor must we omit to urge the importance of examining the under sides of stones in the vicinity of ants' nests, in which position, during the spring and summer months, many of the rarest of our native Coleoptera may be occasion-

ally procured." Excrementitious matter always contains many interesting forms in various stages of growth.

The trunks of fallen and decaying trees offer a rich harvest for many wood-boring larvæ, especially the Longicorn beetles; and weevils can be found in the spring, in all stages. Numerous carnivorous Coleopterous and Dipterous larvæ dwell within them, and other larvæ which eat the dust made by the borers. The inside of pithy plants like the elder, raspberry, blackberry, and syringa, is inhabited by many of the wild bees, *Osmia*, *Ceratina*, and the wood-wasps, *Crabro*, *Stigma*, etc., the habits of which, with those of their Chalcid and Ichneumon parasites, offer endless amusement and material for study.

Ponds and streams shelter a vast throng of insects, and should be diligently dredged with the water-net, and stones and pebbles should be overturned for aquatic beetles, Hemiptera and Dipterous larvæ.

The various sorts of galls should be collected in spring and autumn and placed in vials or boxes, where their inhabitants may be reared, and the rafters of outhouses, stone-walls, etc., should be carefully searched for the nests of mud-wasps.

Fig. 1.

Collecting Apparatus. First in importance is the *net*. (Fig. 1.) This is made by attaching a ring of brass wire to a handle made to slide on a pole six feet long. The net may be a foot in diameter, and the bag itself made of thin gauze or mosquito-netting (the finer, lighter, and more durable the better), and should be about twenty inches deep. It should be sewed to a narrow border of cloth placed around the wire. A light net like this can be rapidly turned upon the insect with one hand. The insect is captured by a dexterous twist which also throws the bottom over the mouth of the net. "The frame of the net which I use is illustrated herewith (Fig. 2), and will be found strong and serviceable and conveniently portable. It is constructed as follows: Take two pieces of stout brass wire, each about 20 inches long; bend them half-circularly and join at one end by a folding hinge having a check on one side (*b*). The other ends are bent and beaten into two square sockets (*f*)