COLLECTING, PRESERVING AND STUDYING INSECTS

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Collecting, Preserving and Studying Insects

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WARNING

It is dangerous to use Ethyl-acetate in light-trap because the vapour is inflammable. The devices in figures 26–29 should be used with tetra-chlorethane only.

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INTRODUCTION

Once, when I was collecting insects, a local official stopped and asked what I was doing. When I had explained, and shown him what I had caught, he made two comments: 'It's a strange occupation for a grown man', and, 'Surely all those things are known already'. If either of these were true, this book would not be necessary.

Collecting insects may be either an end or a beginning. Taken at its simplest level, just to build up and arrange a collection appeals to an instinct that is present in all of us. Compared with, say, stamp-collecting, it has the advantage of taking the collector out of doors, to spend sunny days in the country. Like photography and painting, with which it may compete in interest, it develops keen and accurate observation, which adds enormously to anyone's pleasure in the countryside. Whether these are suitable activities for an adult depends on whether we bring an adult mind to bear on them.

But there is more to collecting insects than just catching and arranging them. We are all used to gardening books and nurserymen's catalogues, which seem to know all the plants that exist and everything about their habits and their cultivation. Not surprisingly, the average person thinks that all this sort of knowledge was discovered long ago. By the same reasoning, it is assumed that there are people who know all about insects, too.

Nothing could be further from the truth. No one knows how many different kinds there are in the British Isles, and the figures for the world, given in Chapter IX, are a pure guess. What is more, the great majority of insects are little more than names even to specialist professional entomologists. Take a volume of the *Handbooks for the Identification of British Insects*, or the *Faune de France*, and you will be astonished to see how little information is given there about the life-history, or even the habits, of most of the insects listed. Some are vaguely said to be found 'on vegetation in wet places', and so on, but about the majority of species the authority is silent. Think how many words have been written about the honey-bee; then imagine how long it will be before the twenty thousand British insects, or the million that may exist in the world, have been studied to the same extent.

The real value of an insect collection, therefore, is not to admire it, but to use it to study living insects. There is no need for me to explain the attraction of such a study, since many lucid and persuasive writers, led by Fabre, have shown something of the diversity of insect-life, and the beautiful mechanisms of adaptation by which they fit themselves into their surroundings. But none of this can be understood until we can identify the insects, and separate one from another.

It was for this reason that I felt that a book on collecting alone would be to stop half-way, and that I ought to give some indication of how to find out more about the insects you have caught, and how to make known the new discoveries that you are certain to make as soon as you begin to observe insects more closely.

The early chapters, therefore, discuss where to look for insects, and how to catch them; how to bring them home, and how to make a permanent collection out of them. In all these matters each entomologist has his own pet ideas, and it is not possible to catalogue them all. The important things are the basic principles. Where one expert says he always mounts his specimens in ABC solution, another swears by XYZ; the secret of success in each case is usually not the special formula, but the skill and experience that each brings to the job. And when it comes to being recommended to use 'a mounted pin-feather of a snipe or woodcock', or 'an eyelash mounted in a matchstick', we are being given entertainment rather than instruction.

So far as collecting the insects is concerned, the real secret is not in having the right equipment, but in understanding the ways of the insects when they are alive, and that is why I have put observation first, and collecting second.

The chapters on studying insects will be found to deal mainly with identification, and the recognition and description of new species: not because this is the whole of entomology, but because it is the keystone upon which all the rest depends. It is the present fashion to look down upon systematics—and, indeed, upon natural history in general—as unscientific pursuits. 'It is probably true to say that, except in so far as they contribute to theories and generalisations, the scientific mind is not interested in facts [the attitude that] the scientific theory has less appeal than the facts themselves . . . is characteristic of the naturalist' (Wigglesworth, 1956).

Unfortunately, when theories conflict with facts, the facts always win. So if anything in this book should encourage you to

become a systematic entomologist, be consoled by the fact that your work, unscientific though it may be, will probably outlive a good many theories.

It is a pleasure to express my thanks to the members of the Shell Film Unit for a most enjoyable visit to their studio, and to Professor R. M. Gordon and the authorities of the Liverpool School of Tropical Medicine for the use of the photograph from which Plate VII is taken. I am grateful to a number of friends who have given me the benefit of their experience in collecting and preserving insects. Most particularly, I am indebted to my wife and my son David, for their indispensable help at all stages of the work.

NOTE

The following arbitrary rule has been adopted concerning the use of hyphens in popular names ending in the syllable *'fly'*.

Names of insects that are true flies carry a hyphen; e.g. *house-fly*, *bot-fly*, *crane-fly*. Names of insects that are not true flies are written as single words; e.g., *butterfly*, *dragonfly*, *mayfly*. Exceptions arise when a proper name is involved or if the use of a single word seems grotesque. In such cases the word *'fly'* is printed separately, as in *Dobson fly*, *ichneumon fly*.

COLLECTING INSECTS

I

WHERE TO LOOK FOR INSECTS

Insects are everywhere. There is almost no place in the world where life is possible and where insects are not to be found. To begin to study them it is not necessary to go to distant countries, or to search in out-of-the-way places. You can make a start in your garden or, if you like, in the house itself.

At first, you will want to catch and look at nearly all the bigger specimens you see, but once you have a fair idea of the Orders of insects (see Chapter IX) you will do better to limit your interest, either to some group, such as beetles, moths, or dragonflies, or to some particular setting, say the insects of a sand-heath, or a pond, or those which live on one kind of plant. Whichever way you choose to approach your collecting, do not be in a great hurry to catch and kill the insects, but spend as much time as you can watching them going about their daily life.

To find the insects you want you will need to have some idea of how they live, and what they require at different stages of their life. Nearly all insects begin life as an egg which is laid in such a position that the newly hatched young insect will find food and shelter provided close at hand. In many groups, the young insect is very much like the adult, except for the absence of wings, and then you may expect to find the young and the adults together, or at least close by. Thus a colony of greenfly on a stem will include both adults and young; and dragonflies can be caught in the air over the water in which the nymphs are living.

In contrast to this, the more advanced groups hatch into a larva that is quite different in shape from the adult, so that if we did not know better we might well believe it was quite a different insect. Think of a honey-bee and its white, legless, almost helpless larva. Such larvæ may live in surroundings totally different from those of the adult insect, and for collecting purposes we must

treat them as if they really were different insects. To enable these insects to rebuild themselves from a larva into an adult there is a resting stage, the pupa or chrysalis, and this again has its own habitat, often unlike that of either of the other two.

Remember, therefore, that catching the adult insects is only one part of collecting, and by itself gives a very one-sided view of their life-history. To know an insect well you have to find the young insects, keep them alive, rear them to maturity, and get them to mate and lay eggs. We shall return to this again in Chapter III.

The things that insects of all stages are concerned with are light, warmth, food, moisture and shelter, and it is by trying to see these things from their point of view that we can learn to anticipate the movements of insects, and to know where to look for them. Some skilled collectors show an uncanny, almost instinctive knowledge of the ways of insects, and always seem to take the rare or unusual insects, while other collectors at the same time and place are getting only the most commonplace species.

A good place in which to start collecting insects is a *flowering hedgerow* on a warm, sunny day. Certainly you can collect in winter, or on a dull, cold day, but then you have to be more patient, and more skilled, to be successful.

Before you do anything else, stand and watch for a while. See how the pollen-loving insects work over the flowers. Some, like the bees, go from flower to flower, wasting little time, and collecting almost continuously. Others, notably the butterflies, some moths, and many flies, love the warmth of the sun, and spend much of their time just basking, either quite still, or slowly opening and closing the wings. At the opposite extreme are the hoverers, which are able to remain poised in the air, apparently motionless, but with the wings moving at very high speeds. These look deceptively easy to catch, but try it, and see how quickly they can dart away in any direction. Some of them hover like this for mating purposes, making it easier for the two sexes to find each other: often it is the males that gather into a dancing swarm, like the midges on summer evenings, and in the tropics some hoverers have silvery or iridescent patches on the body, which glisten in the sunlight, and attract attention from a distance. If you know this, collecting them is made much simpler.

The leaves and stems of the plants shelter many insects. Underneath the leaves you may find clusters of eggs, or a hanging pupa, as well as many insects that are just keeping out of the way and