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How to Make Insect Collections  
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# How to Make INSECT COLLECTIONS

By Walter F. Morofsky

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*Beginners collect and study their own specimens (above, left) in the entomology laboratory.*

*Ten thousand insect specimens (above, right) are available for advanced study.*

*Forest insect students (below, left) examine damage done to forest trees.*

*Bottom samples of aquatic insects are taken from the Red Cedar River (below, right) for study by entomology students.*



# How to Make Insect Collections

By

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*Department of Entomology*

THIS PUBLICATION PRESENTS INSTRUCTIONS AND ILLUSTRATIONS ON THE proper preparation of insect specimens. In general, the methods presented are for insects to be used as a working collection for instructional purposes, although if mounting is carefully done, the insect specimens may be used in a permanent collection or as display material.

## COLLECTION OF MATERIAL

It is always a good policy to make a collection if one desires to know insects, because the undertaking affords him opportunity to observe insects in their natural environment and to learn at first-hand how and where they live.

Every locality provides an abundance of insects important to field crops, horticulture, forestry, conservation, stored products, the household, and many other closely related subjects. In fact, there are few phases of human economy unaffected by insects. Therefore, it is important when on a collecting trip to use every opportunity, not only to collect and identify insects, but to observe their habits, food, hiding places, and adaptation to surroundings.

## MATERIALS NEEDED TO MAKE COLLECTION

A compact collecting outfit should contain:

1. *Collecting nets*
2. *Cyanide bottle*
3. *Insect box*
4. *Insect pins*
5. *Date and locality labels*
6. *Order and family labels*

## THE COLLECTING NET AND KILLING BOTTLE

The two most important necessities in making an insect collection are the net and the cyanide bottle.

The regular collecting net has a 12-inch hoop and a 30- to 36-inch

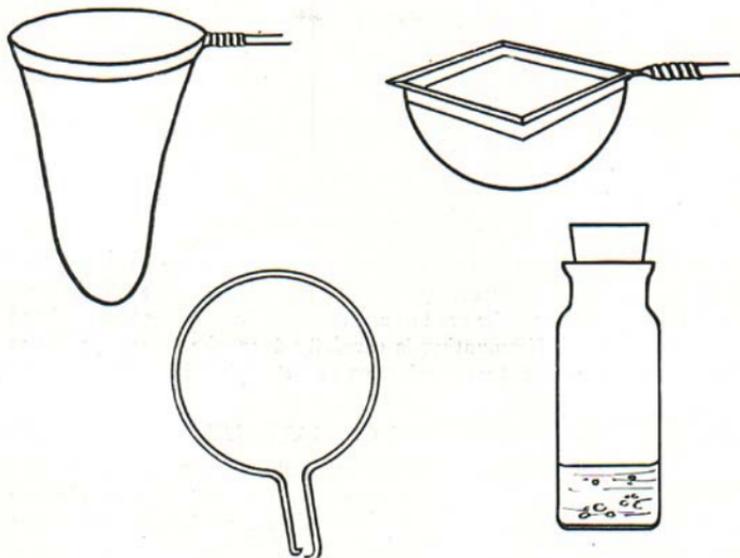


Fig. 1. Typical nets and cyanide bottle.

handle, with a cloth bag made from some fairly strong material such as muslin or scrim. The bag should not exceed the length of the arm, or about 24 inches. Often home-made nets are made with too long a handle and bag. Excellent nets may be purchased.

Several types of nets are used for specialized collecting. A "sweeping net" should be fairly strong, using No. 6 wire, equipped with a strong handle and strong bag. The "air nets" should be fairly light in construction, using a No. 8 wire frame and a light, strong handle. In collecting aquatic insects the "dip net," as shown in the upper left corner of Fig. 1, is a necessity and should be made of heavy steel framework, using a long handle and a coarse mesh bag made of cloth or screen.

The killing or cyanide bottles (lower right of Fig. 1) may be purchased as the making of these bottles by amateurs is DANGEROUS. *Killing bottles usually contain sodium cyanide, which is a DEADLY POISON.*

A druggist or one familiar with the care necessary in handling poisons can readily make a satisfactory cyanide bottle. The cyanide, if in chunks, should first be broken into small lumps. These are put into the bottom of the bottle, and covered lightly with dry plaster of paris or sawdust. Over this a mixture of plaster of paris with water, just thick enough to flow, is poured, covering the dry plaster of paris about  $\frac{1}{4}$  inch.

Then, let dry. Make sure that no air bubbles appear. When sawdust is used, cover first with a tight-fitting blotter to prevent the sawdust and cyanide from falling out.

A well-made bottle will last for several years. Should the bottle collect moisture, place small strips of absorbent paper or blotter inside because many insects will be spoiled if left in a damp bottle. Killing bottles should not be left open at anytime or placed where small children can reach them; others should be impressed with the possible danger of these bottles.

Cyanide bottles should be labeled *POISON*.

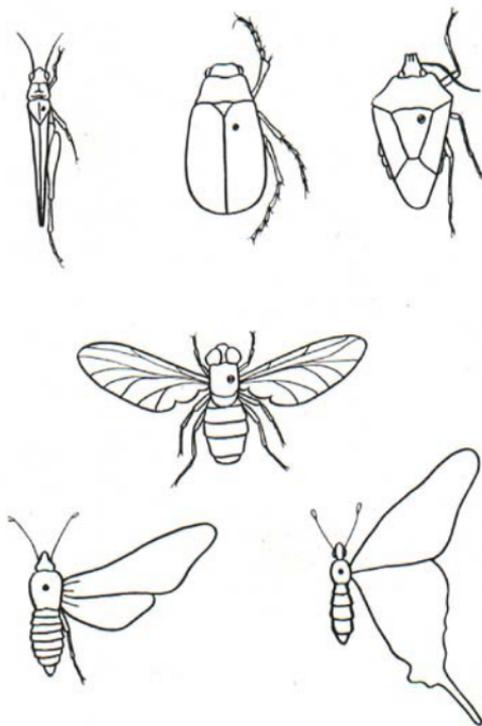


Fig. 2. Correct pinning.

- No. 1—Upper left—Orthoptera (Grasshoppers, etc.). Pin through the prothorax.  
 No. 2—Coleoptera (Beetles). Pin through the right wing cover.  
 No. 3—Hemiptera (True bugs). Pin through the scutellum.  
 No. 4—Diptera (Flies). Pin through the thorax as indicated.  
 Nos. 5 and 6—Lepidoptera (Butterflies and Moths) and all other orders are pinned through the center of the thorax as shown.

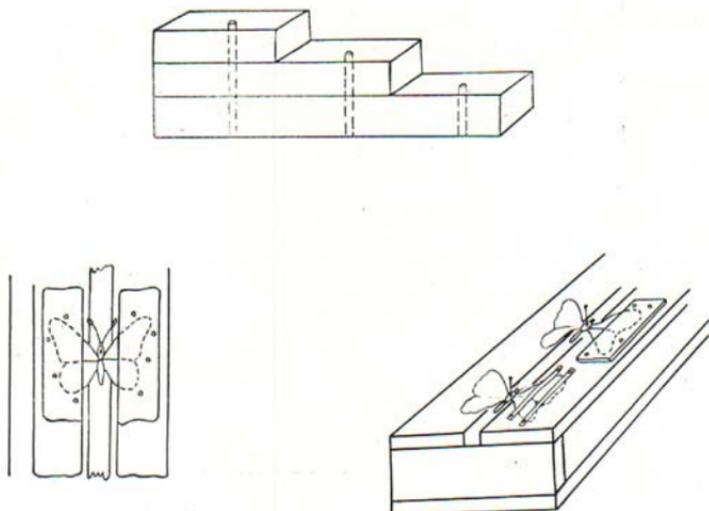


Fig. 3. Upper drawing shows pinning block, lower drawings show mounting boards with correct mounting of moths and butterflies.

### MOUNTING INSECTS

At the end of each collecting trip, the care of the material collected is very important. The specimens should not be left in the killing bottle longer than 3 to 8 hours because after a time they become brittle. Common pins are too large for most insects. Therefore, it is necessary to purchase insect pins from supply houses. These pins are made in numbered sizes. The most common sizes used are No. 2 or No. 3 for larger specimens and double mounts, such as points for smaller insects.

The most painstaking task comes in correctly mounting the specimens obtained. Certain types of insects are pinned by inserting the pin through a definite part of the body. This rule has been established for these kinds of insects in order to pin them firmly through the heavier parts of the body.

Figure 2 illustrates the variations in the correct mounting of the various orders of insects.

### PINNING OF INSECTS

The height at which insects are placed upon the pin should be uniform, usually with about one-third of the pin showing above the dorsal side of the insect. This is important in order to leave sufficient room at the head of the pin to handle it easily without breaking the insect. In order

to have uniformity in pinning, Fig. 3, upper drawing, shows a simple pinning block which may be made or purchased for this purpose.

Properly mounted moths, butterflies and skippers must have their wings spread; this perhaps is one of the most difficult operations for the beginning students. Figure 3, lower drawings, illustrates the correct methods used, with the aid of a stretching board, in mounting this order of insects. Specimens of this order are of little value unless properly mounted.

### LABELING OF INSECTS

A specimen without proper date and locality label is worthless. The labels are put well up on the pin, a little below the insect as shown in upper drawing of Fig. 4. Certain firms print these labels from small type or they may be hand-made with a small crow-quill pen.

Similar labels should be the same height on the pin. This is easily done by using the pinning block. Make sure that each specimen has the correct date and locality label; later, identification labels, if desired, may be placed on the specimen.

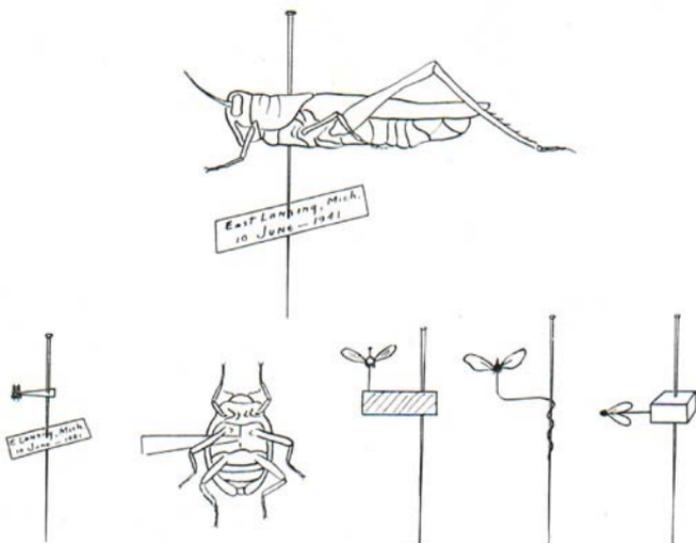


Fig. 4. Upper drawing shows correct mounting and labeling of specimen. Lower drawings show methods of mounting small insects. These should be placed on points or minutennadeln pins, as shown.

### INSECT BOXES

Specially constructed insect boxes are usually used for storing insects. For beginning students, cardboard boxes, made with bottoms lined with some material such as Balsa wood or composition board such as Celotex, may be used. One should be sure that a soft material is used in order that the insect pins may be inserted with ease. Although wooden boxes are more expensive, they are better for insect collections than those made of cardboard. Both types of insect boxes may be procured from any of the biological supply houses.

### THE HAND LENS

A small hand lens will be found useful for field or home work because many of our insects are small and difficult to determine with the naked eye. As a rule, the beginner looks for large specimens and disregards the smaller insects. An effort, however, should be made to obtain the smaller insects because specimens of important forms are overlooked unless the student realizes the importance of the hand lens.

### THE COLLECTION

After a collection has been made, certain precautions should be taken to keep other insect pests out. Museum pests will often ruin a collection if it is stored for any length of time. These pests may be prevented from damaging the collection if one places a few P.D.B. (paradichlorobenzene) crystals in the box.

### GROWING INSECTS--BREEDING CAGES

One of the most interesting phases of insect study is the rearing of insects. Figures 5 and 6 show types of these breeding cages. These cages are simple and can be made by any interested person.

The left-hand cage, Fig. 5, may be made by use of a lamp chimney and flower pot as shown. The ventilation provided by the cloth or screen top is very necessary to prevent "sweating" in the cage. This is a very good type of cage, where one may grow larvae collected in the field, owing to the fact that the food plant of the insect may be planted in the cage. The right-hand cage of Fig. 5 may be used in a similar manner excepting for the planting of plants.

If lamp chimneys and flower pots are unavailable, workable, though not so satisfactory, rearing cages may be made from wide-mouth glass jars. Ventilation in such cages is difficult.

Figure 6 is a very convenient type of cage for rearing large quantities of insects and also for large insects such as moths and butterflies.

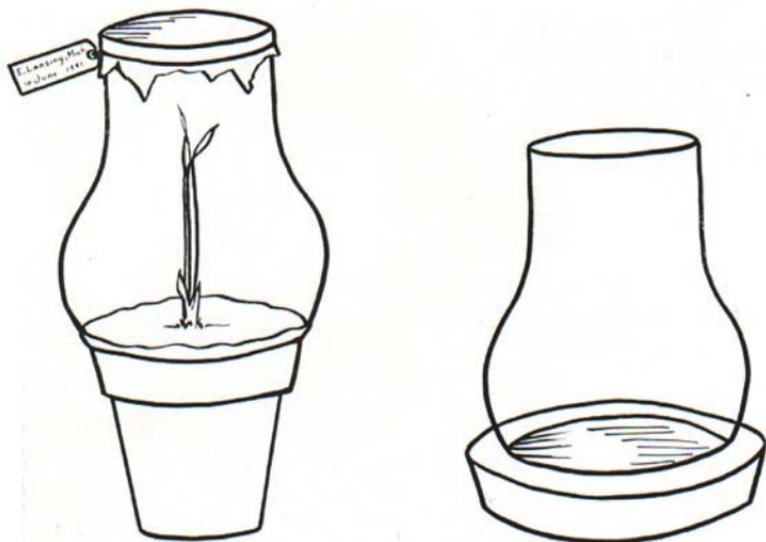


Fig. 5. Two types of breeding cages.

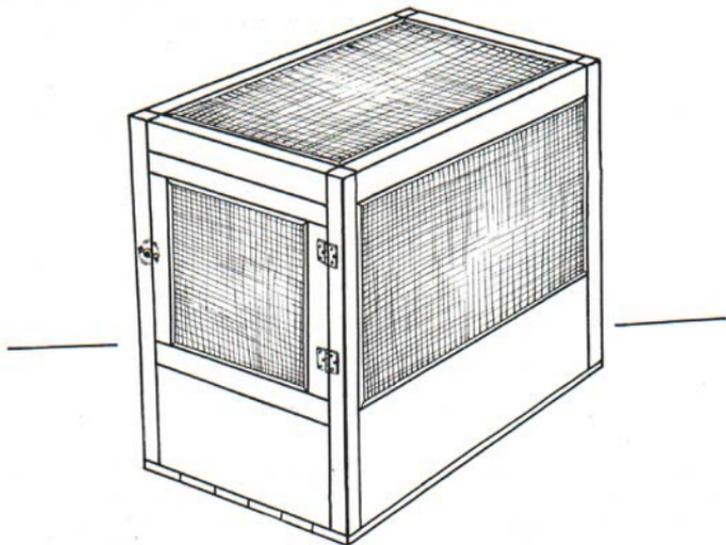


Fig. 6. Cage for hatching out larger insects, as moths and butterflies.



*Fig. 7. Typical trap used in collecting insects.*

Many types of cages are used in the rearing of insects, but these as shown are easily constructed and can be used over a period of years.

### PRESERVATION OF YOUNG

Many times students become interested in the collecting and preserving of the immature forms of insects such as aquatic larvae and nymphs. These are best preserved in a mixture of 10 parts of distilled water, 10 parts alcohol, and 1 part formalin. This is known as "pickelene" and is a very good preservative for immature forms of insects.

### ENTOMOLOGICAL SUPPLY DEALERS

Below are listed a few entomological supply dealers. There are many other dealers in insect supplies.

General Biological Supply House  
761-763 E. 69th Place, Chicago, Ill.

N. Y. Biological Supply Co.  
34 Union Square, New York, N. Y.

Ward's Natural Science Establishment, Inc.  
P. O. Box 24, Rochester, N. Y.

Central Scientific Company  
460 E. Ohio Street, Chicago, Ill.

Chicago Apparatus Company  
1735-43 N. Ashland, Chicago, Ill.

## BOOKS

Authoritative, understandable information on insects, particularly their identification, is sometimes difficult to obtain because of the great numbers and varied insect forms. A few of the many helpful books on insects are listed:

- Comstock, J. H.—An Introduction to Entomology—Comstock Publishing Co., Ithaca, N. Y.—9th Edition—1940
- Essig, E. O.—College Entomology—Macmillan Co., N. Y.—1942
- Herms, W. B.—Medical and Veterinary Entomology—Macmillan Co., N. Y.—3rd Edition—1939
- Lutz, F. E.—The Field Book of Insects—G. P. Putnum's Sons, N. Y.—1935
- Macy, R. W. and Shepard, H. H.—Butterflies—Lund Press Inc., Minneapolis, Minn.—1941
- Metcalf, C. L. and Flint, W. P.—Destructive and Useful Insects—McGraw-Hill Book Co., N. Y.—2nd Edition—1939
- Metcalf, Z. P. and Metcalf, C. L.—A Key to the Principal Orders and Families of Insects. Published by the authors Z. P. Metcalf, N. Carolina State College, C. L. Metcalf, University of Illinois—1928
- Morgan, Ann H.—Field Book of Ponds and Streams—G. P. Putnum's Sons, N. Y.—1930
- Needham, J. G. and Needham, P. R.—Guide to the Study of Fresh Water Biology—Comstock Publishing Co., Ithaca, N. Y.—1938

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