

Butterflies

for a

Hobby



ESTHER PARNELL HEWLETT

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"Winged flowers, or flying gems"

The study of butterflies and moths, the most beautiful of all insects, can become a fascinating hobby, opening the door into a whole new world of pleasure and interest. The collecting and breeding of these exotic creatures to supply the demand for private, museum and college collections and art purposes, is called "Butterfly Farming." There are thousands of collectors who are continually adding to their collections. Entomologists, directors of museums and college professors are buyers, and butterflies are used to some extent in jewelry. But a new and different demand has been created within the last few years by the tardy recognition of the possibilities in butterflies and moths as material for works of art.

Beautiful and useful articles can be made for the home, for gifts and for sale, by mounting our native butterflies and moths under glass. They are easily framed in trays, pictures, book ends, jewel boxes and other attractive articles,

at little expense. One's originality can create individual ideas and arrangements from these lovely creatures—

"All diamonded with panes of quaint device,
Innumerable of stains and splendid dyes"

There are hosts of brightly-colored butterflies and night-flying moths in almost every locality,—to be had for the catching or raising. Prepared properly and combined with pressed and dried ferns, grasses and tiny flowers on a milkweed floss or thistledown background, their exquisite colorings and markings are preserved to be studied and admired in works of art.

A butterfly's life is short. A few butterflies and many moths have no digestive apparatus. They take no food, so live only a week or two. Others exist for a month or two, and a few go over the winter. But all fall prey to the common fate of all butterflies and moths,—that of getting weaker and weaker and more tattered and torn, until they are eaten by the hungry bird, bat, toad, frog, spider or the ever-present ant. With a life so short, it is not cruel to put them to sleep before they have become torn and helpless, and mount them where their beauty may be enjoyed for many years. There is no danger of extermination, for a single butterfly will lay as many as two hundred eggs and some moths will deposit a thousand.

Butterflies and moths are found almost everywhere that plant life grows. In North America, from the Rio Grande north to the Arctic Circle, there are nearly 700 species of butterflies,—about the same as of birds,—and many more of moths. Some species are world flyers, but the majority fly in rather restricted localities or sections of the country. A difference in altitude often causes a change in coloring in some species, specimens caught at high altitudes having a deeper color.

There is a very great range in size, from the tiny micro-moths only $\frac{1}{8}$ " or less across the wings, to the enormous butterflies and moths from the hot, steamy islands of the South Pacific which have a spread of over ten inches. Those found in the tropics are more brightly colored than in the cooler climates, with marvelous blue and green and red colorings. The huge, iridescent "Blue Butterflies" so much desired for art work, fly in South America and up into Central America and Mexico. They belong to the genus "Morpho" and there are many species ranging from a wonderful deep blue, through bronze and striped and spotted species, to the pale blue and lavender types. All are a brilliant, iridescent color which no paint or satin can equal.

Some butterflies and moths are camouflaged with "protective coloration" to escape their enemies. One of the best of these is the Dead-leaf Butterfly with several species in Africa and India. On top the wings are highly colored, but the under side is gray or brown and marked like a leaf, with a midrib line, a small clear spot like a worm hole, and a wing projection forming the stem of the leaf. Perched on a tree or bush with its wings folded, this butterfly would fool any hungry bird into thinking it was only an uninteresting dead leaf.

About 16 species of fossil butterflies have been located, some of them close to present-day species. The fossil remains of another insect, a dragonfly with a wing spread of two feet, have also been found.

LIFE HISTORY

Butterflies and moths come under the grand head of Entomology which includes all insect life. This is divided into eleven different orders, Lepidoptera,—being butterflies and moths; Orthoptera,—grasshoppers, katydids, walking sticks, mantids and crickets; Coleoptera,—beetles; Hemiptera,—cicadas (commonly called locusts); and so on.

Lepidoptera (moths and butterflies) is one of four orders which undergoes a complete metamorphosis, passing through four stages of development,—first as eggs, then larvae or caterpillars, next as pupae (chrysalids or cocoons), and finally as perfect, fully-developed insects. The other seven orders leave out one or more of these four life processes.

A butterfly is not a moth, nor is a moth a butterfly any more than a firefly is a ladybird, or a mosquito a housefly. They both belong to the great order of Lepidoptera, but the two suborders into which this order is divided, Heterocera (moths) and Rhopalocera (butterflies), are separate and distinct. These are divided again into family, sub-family, genus and species. Butterflies are generally known by two names,—the genus name and the species,—and many have been given additional "common" or popular names.

The name Lepidoptera comes from two Greek words meaning "scale-winged." The wings of butterflies and moths consist of a framework of horny tubes connected by a membrane, these tubes or veins being double, the inner tube filled with air and the outer with blood. The wings of most species are covered on both sides with over-lapping scales like the shingles on a roof. These are minute and very beautiful, varying in shape and color.

Butterflies usually fly by day only. While some moths are day fliers, the majority are on the wing only at dusk or night. The antennae of butterflies are "clubbed," having a little swelling or knob at the end. The antennae of many moths are threadlike and taper to a sharp point. Those on the swift-flying Hawk or Sphinx Moths are heavy, thick spikes, while the large, velvet-winged "Silk Moths" have antennae like delicate fern fronds.

COLLECTING

"Hast thou heard the butterflies,
What they say betwixt their wings?"
—Tennyson

For a start in collecting and raising butterflies and moths, the first requisite is access to several illustrated books. Most public libraries have copies of "The Moth Book" and "The Butterfly Book" by Dr. W. J. Holland,—standard works for North America. These contain colored photographs which are helpful in identifying the specimens. Or perfect specimens may be sent to an entomologist for identification. Many professors of entomology will willingly do this, retaining the specimens as their fee.

The first necessity of equipment is the butterfly net. Any kind of a strong, light-weight pole will do, but a 3 or 4-ft. length of bamboo fishing pole makes an ideal handle, especially the small end with the ferrule on tip. For the hoop, bend a 45" piece of heavy wire into a circle with 3" of each end turned out sharply. Run these ends through the



ferrule on handle and bind to pole securely with fine wire or strong cord. For the casing on hoop, cut a piece of muslin $3\frac{1}{2}$ " wide and about 40" long. Turn each edge over $\frac{1}{2}$ ", fold the strip lengthwise in center and slip it over the hoop wire. The bag can be made of mosquito netting if nothing else is available, but a stronger curtain bobbinet lasts much longer. Either of these materials should be washed first to remove the stiffening. Then with the material doubled, cut a long tapered "U" shape, about 21" across and 25" long. Sew up the side seams, turn the raw edges over again and stitch down for a smooth finish. Slip the top edge inside the muslin casing on hoop and stitch.

A pint fruit jar or any wide-mouth jar with a screw cap makes a satisfactory killing bottle. Enough Sodium Cyanide or Potassium Cyanide to cover the bottom of the jar should be cracked into pieces not larger than a medium-sized marble, handling with great care as it is a deadly poison. Place in the jar and cover with a layer of cotton to hold the crystals in place. Cut a round of writing paper $\frac{1}{2}$ " larger than the jar and slash around the edge to a depth of $\frac{1}{2}$ ". Put paste on these slashes and push the paper down onto the cotton. The slashes will bend up and adhere to the sides of the jar, against which they must be pressed smoothly and tightly. Prick some holes in the paper with a hatpin. There is no further danger from using the jar. The fumes from the Cyanide work up through the cotton and the holes in the paper and render the butterfly or moth painlessly unconscious in a few moments. If the jar becomes weak after continued use, a teaspoonful of water will revive its strength. Several killing bottles should be made, and also a large jar or can with a tight-fitting top for extra storage space, preparing it with Cyanide, too.

Butterflies and moths should be handled with forceps and as little as possible with the fingers. Several styles of insect forceps can be purchased at drug stores or at entomological supply houses, but those with blunt or rounded points are preferred. With these grasp the specimen from the front at the base of upper wings close to body.

Butterflies can be caught while in flight or when clinging to flowers. Give the net a quick swing, then tip it so the hoop is horizontal, and the butterfly will be in the lower

half of the bag which hangs down over one side of the hoop. Hold the net handle firmly between the knees, uncap the killing bottle, insert it carefully into the net, get the butterfly into it and re-cap. There is a knack in transferring the butterfly from net to jar, without losing or marring it, that is learned only by practice and experience.

In a few seconds when the butterfly is unconscious, remove and examine it. If on inspection it is found to be perfect,—and "perfect" means absolutely without scratch, rub, tear, notch, loss of antennae or feet, or other blemish,—it should be saved for sale or mounting. Fold the wings together over the back and slip it into a paper envelope previously marked with the name and sex of the specimen, locality and date of capture, and the collector's name, then store it in the large Cyanide storage bottle for several hours. Only perfect specimens are marketable. As in any other business, quality is the prime requisite for success. If the insects offered for sale are perfect, a reputation is built up, and customers will come back year after year and will recommend one's work. Requests will also come for other insects,—crickets, grasshoppers, katydids and cicadas,—and it pays to furnish only first-quality material.

To make the envelopes, cut squares of typewriter paper or blank newspaper from 3" up to 6" or 7" in size. Fold them once cornerwise, then fold the two short sides over $\frac{1}{4}$ " to close the envelope. Press flat with a hot iron. Carry a supply of these when collecting.

Often a butterfly becomes unconscious with its wings turned down over its legs. In this case, hold it by one wing with the forceps, blow gently between the wings, and as they flutter apart, catch the free wing against the extended forefinger of the left hand and turn it up into proper position against the other, before placing it in an envelope.

Butterflies and moths are where you find them. The collector must go where they are, and that is often in the most improbable and unusual places.

"Beside the stream, collected in a flock,
The noiseless butterflies"
—Wilcox

On warm summer days, many species of butterflies are seen by the dozen on damp spots in the garden or by a stream, as thick as they can stand, sucking the moisture from the wet earth, and are so busily engaged that the entire group can often be taken in the net. Drop the net swiftly down over them, flat on the ground, holding the net bag straight up above hoop. As they fly up into the raised bag, lift the net and drop the bag over one side in the usual way.

Many moths are attracted at night by porch and garden lights, or lighted bouquets of flowers. Some of the large, night-flying moths are gorgeous creatures, with the Cecropia and the Polyphemus and the Luna being the best known. A few of the swift Hawk Moths fly throughout the sunny hours, but the majority begin darting around flowers as dusk falls.

Night-flying moths can also be lured by the "sugaring" method. Prepare a sweet, fermented mixture,—a blend of rotten apples and molasses is effective,—and paint it on tree trunks or fence posts just before dusk. Then after dark, go around quietly with a flashlight and killing bottles to collect

the catch. There will usually be several moths clinging to each tree or fence post, sipping the intoxicating mixture, and they can easily be flipped into a killing bottle. Some moths fly in the early evening, others later in the night, so it is well to make several rounds of the sugaring posts. Many moths which will not come to lights, are caught by this method.

If much collecting is done, there is always the possibility of finding a new species, a "freak" or an aberration,—specimens which do not run true in markings or coloring. Such oddities bring high prices even if they are common varieties and somewhat imperfect. There are hobbyists who specialize in collecting and purchasing such unusual specimens. Some species are especially subject to aberration, others have dark forms, and albino or white forms.

BREEDING

If the captured butterfly is an imperfect male, lay it on a leaf or bush and in a few minutes it will "come to" and fly away as good as new. Here the amateur may encounter some difficulty in determining the sex of his capture. In many species, the sexes are differently marked or colored, in others, such as the large "silk moths," the antennae of the male are much wider than those of the female. Almost always the body of the female is larger than the male's.

If the captured butterfly is an imperfect female, drop her into a paper bag and fasten it with a snap clothespin around a branch or spray of the particular larval foodplant of that species of butterfly. There she will revive, and will usually deposit her eggs upon the plant spray enclosed with her in the bag.

If the larval foodplants of one species of a genus are known, it is well to try plants of the same group on others of the genus, though this rule does not always hold good. For instance, many species of the *Lycaena* or "Meadow Blue" larvae feed on legumes,—alfalfa, vetch, *hosackia*, lupine and others. The three species of "Monarchs" all feed on various varieties of milkweed, and several of the *Papilio* or "Swallow-tails" choose leaves of the apple, chokecherry, willow, oak or hop vines for their larval food.

While keeping the butterfly confined in the paper bag, feed her twice a day on dried apple soaked in sugar or honey water. Drop a piece or two at a feeding into the bag. She will not eat the apple but sips the syrup. She must be protected from ants and a simple method is to paint a band of Tree Tanglefoot around the branch above the sack. This is a very sticky substance which ants will not cross, and can be bought at seed stores.

In freedom, the female butterfly and moth usually lays her eggs on the particular foodplant that will be eaten by the caterpillars to hatch from her eggs. In captivity, most butterflies will not lay a single egg unless placed on the plant that their larvae eat, while the majority of moths will lay on anything that is convenient,—the sides of a box or the inside of a paper bag. The eggs are deposited singly, in small clusters, or in large groups, depending on the habits of the species.

Butterflies and moths are expert botanists. The females

are often seen flitting around and around, industriously hunting some particular plant. They are not familiar with the long Latin names but they do know the plants. Whether they tell by sight, or sense of smell, or instinct no one knows. Much may be learned as to foodplants by watching these hovering butterflies. If observed closely they are found to be placing their eggs here and there on the leaves or buds of the favorite foodplant of their larvae.

"And what's a butterfly, at best?
'Tis but a caterpillar dressed"

Some eggs of butterflies and moths hatch in 4 to 6 days, others take several weeks, and many moth eggs go over the winter until Spring. They need no human help or incubation beyond what nature provides of sunshine and warmth. The eggs are all colors and shapes and sizes, and under a microscope show wonderful ornamentation. Many have a thin, hollow spot on top where the tiny worm hatches out. We say "hatches," but really it eats or breaks its way out, seeming much too large for the space it occupied, and very often, it finishes the empty shell for its first meal.

The caterpillars of the smaller butterflies and moths are very tiny when they first emerge, while others are $1/16$ " to $1/4$ " long. When they are so tiny as to be almost microscopic, it is best to leave them undisturbed for a few days or a week, to feed and grow on the spray of foodplant on which they were hatched. Then they can be moved to glass-covered dishes, netting covered boxes or cans, or to fruit jars. Keep them frequently supplied with fresh green sprigs of their foodplant.

These cages must be protected from flies, ants and other insects which might lay eggs in the young caterpillars, causing their death later. Again, a band of Tree Tanglefoot painted around the box or can effectively discourages ants. This also keeps the caterpillars from crawling out. Cover the bottom of each container with several layers of newspaper to absorb moisture and catch the droppings. This can easily be changed each day to keep the containers clean.

The larvae eat and grow for 3 or 4 days until their skins become too tight, lie quiet for a day or so, when it is best to leave them undisturbed, and then shed their skins. Underneath is a beautiful new coat, often differently colored and ornamented. While the old skin was stretched tight, the new one has plenty of room for expansion. There are generally four or five molts before the caterpillar is fully grown. Some become very large, 6" or more long, and appear quite ferocious with their many-colored spines and projections, but are really harmless.

There are only two or three moths in this country whose larvae are able to inflict injury with stinging spines. They leave a mark much like a nettle sting and about as painful, the scars lasting a week or more. The larvae of the *Papilio* or "Swallowtail" butterflies are big-headed, slug-shaped caterpillars that have two horns which are thrust out from the head to eject a disagreeable odor. This is harmless but is supposed to frighten away birds and other enemies.

To a real "Butterfly Farmer," a strange "worm" is a most interesting find. The first thought is, "What will it make?" And the next, "What does it eat?" Place the "find" in a cage and tempt its appetite with leaves from a half-

dozen plants in the vicinity. If none is eaten, another group can be put in, and repeated until the right foodplant is found.

Some caterpillars feed singly, others in small groups, and some are very social,—living in large colonies. To this last class belong the Mourning Cloak Butterfly larvae which literally swarm over willow branches and can be gathered in great quantities. Caterpillars taken out in the wild will not always mature, however, as they may have been stung by parasitic insects.

Many larvae go to sleep as soon as they hatch from the eggs and hibernate over the winter as tiny little specks. When Spring comes, they wake up, eat and grow to maturity. Many schemes have been tried to keep them successfully through the winter in captivity,—in cold storage and in cellars,—but some die and some live. There must be an enormous loss out doors naturally. Other species hibernate when half-grown, snuggling down under their foodplants for the cold months, resuming their feeding and growing in the Spring.

When the caterpillars are full grown, they stop eating for a day or so and prepare to make their chrysalids or cocoons. Many butterfly larvae spin a little button of silk and hang up to this by the tail so the chrysalids are suspended. Others swing from branches, fastened at tail and by a thread around the body. Still others fasten under rocks and leaves close to the foodplants. Many of the large night moths spin a big silk bag on the limbs of trees and bushes, and are so called "silk moths," though not the real silk moth of commerce. Inside the outer silk case is another smaller one, and inside that the smooth, hard, dark pupa case, within which is the moth.

The Hawk Moths which hum like a Humming Bird as they dart around flowers, come from chrysalids which are made by the caterpillars 6" to 8" underground. When the time for emergence comes, the chrysalis works its way to the surface by wriggling and twisting with the help of a hook on the pointed tip.

Before changing into a chrysalis or cocoon, a caterpillar usually crawls around rapidly for a time, then shrinks to half its length and appears to be almost dead. Finally the skin splits down the back and is worked off, leaving the wet, soft pupa underneath. On this fresh chrysalis can be seen the head, wings and body markings of the immature butterfly or moth inside. This case hardens and dries and is often beautifully colored. The chrysalis of the common Monarch or Milkweed Butterfly is as large as the first joint of a finger,—a beautiful green color, with gold spots, like a jade jewel. Some chrysalids are smooth, others are rough and oddly shaped with spines, and some have the appearance of bits of wood or bark.

Many butterflies and moths remain in the chrysalis stage only a few weeks, some emerge in a week to ten days. Others hibernate in this state, and occasionally the big silk cocoons lie dormant two years. Many species have several broods per year, the final brood going over the winter as chrysalids. These over-winter chrysalids and cocoons should be stored in a cool place protected from mice and ants. They should be sprayed with water whenever it rains outdoors, and kept in as normal a condition as possible. In the Spring, they should be moved to a place where they can be watched carefully.

As the summer-hatching chrysalids are formed on a "Butterfly Farm" and become hardened enough to be handled without injury, they should be removed to mosquito-netting cages. Use a large cardboard carton for a cage. Remove the top and cut out the center of each side, leaving only a framework of the cardboard. Paste mosquito netting on each side and over the top. With some species, the chrysalis turns white and transparent the last day before the butterfly emerges, and the colors and markings on the wings show through the pupa case plainly. Then the case splits over the head and feet and the insect crawls out.

"Lo, the bright train their radiant wings unfold,
With silver fringed, and freckled o'er with gold"

As the butterflies and moths emerge they crawl up the netting sides of the cage and hang suspended. There is nothing in insect life more amazing and thrilling than the rapid development of the butterfly and moth after its emergence from the chrysalis,—almost, it seems a resurrection from the dead.

Hanging pendant, the insect fans its wings slowly, and the process of circulation starts. The wings are not folded or crumpled, but are very tiny, with all the markings perfect. The body is very large, and the exercising circulates the blood from the body through the hollow tubes in the veins, and the wings grow rapidly while the body becomes smaller. Within twenty minutes to a half-hour, some butterflies are full-grown and ready to fly away. Others take longer.

The netting top on the cage should be left loose on three sides, and it is a simple matter to slip a Cyanide jar into the cage before the insects begin to flutter about, and one or two at a time, put them to sleep, place in labeled envelopes, and store in the large Cyanide storage jar for a day. From this method of breeding result the greatest proportion of perfect specimens. They can be sold as specimens, or spread and mounted in art work. Occasionally an imperfect insect will occur which should be turned loose to fly away.

The large night moths, with three cases around them, two of them woven of silk that is hard to slit with a knife, have a harder time emerging. And yet they come forth with scarcely a scale missing. Scientists say the moth ejects a liquid which softens and cuts the silk so it can force its way through. The hole it leaves in the case will often be less than $\frac{1}{4}$ " across, and yet the bodies of some of the moths are as large as a thumb. If freshly-emerged females of these wonderful silk moths are placed on a window screen or in a netting cage outdoors, they will often attract swarms of males which can then be caught with a net.

It is not always possible to "paper" all moths, for most of them do not fold their wings in the same fashion as butterflies. These should be firmly pinned with steel insect pins in cigar boxes which have a piece of cork or linoleum glued in the bottom. A pair of pinning forceps is quite necessary for holding the pin close to the point and pressing it down without bending. The specimen should be placed on the pin about $\frac{1}{2}$ " from the top so that the feet will not touch the bottom of box. A tiny identification label should be on the pin below the specimen. The insect pins and pinning forceps are sold by any entomological supply house.

To ship "papered" butterflies and moths, place the



envelopes in cigar boxes with a layer of cotton at top and bottom. Wrap the boxes in corrugated cardboard or pack in a strong carton. Pinned moths should be relaxed before shipping. Wet a handful of cotton in boiling water, squeezing it so it will not drip. Quickly place it in the moth box and shut the lid tightly. Rewet the cotton several times, and in the course of a day, the vapor will soften the insects so that the antennae will withstand the journey. Pack the box of pinned moths inside a larger box, filling the space between with crumpled paper.

A record note book should be kept of every little bit of new knowledge gained in Butterfly Farming,—length of time for eggs to hatch, foodplants preferred by the caterpillars, number of molts and description of the caterpillars, length of time before the pupae are formed, description of the pupae, and length of time before the butterflies or moths emerge. The foodplants and life histories of a large number of moths and butterflies are not known. Notwithstanding the extensive work that has been done with insects, there is still a great field here for discovery, with the possibilities of adding some interesting and valuable facts to the scientific knowledge of the world.

One of the queerest habits of butterflies and moths is the migration of certain species. Nobody yet knows why they fly hundreds and perhaps thousands of miles across land and water. The cause may be a scant food supply, overcrowding of larvae, or weather conditions. Some migrate singly, others in vast swarms of millions, covering hundreds of miles, all going in the same direction. This is another puzzle which remains to be worked out.

Butterflies for Decoration

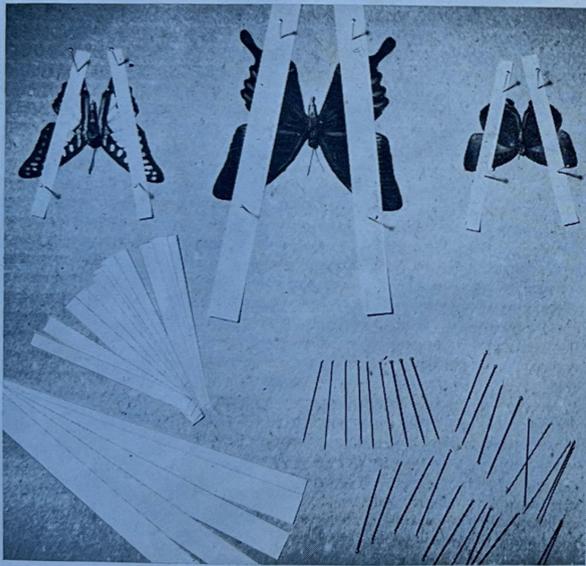
“Butterflies
with wings that were wide as a sail”

Butterflies and moths are beautiful creatures and the enjoyment of their beauty is one of the rewards of Butterfly Farming. To enable this beauty to be preserved where many may see it, they should be mounted for the adornment of the home. A butterfly picture or a serving tray, a pair of book ends or some novelty pieces made of the prettiest butterflies, moths and greenery collected in a summer, are pleasant reminders of those happy months.

PREPARATION OF SPECIMENS

It is well to include in each picture or tray one or two butterflies with wings folded and perched on a flower or grass stalk, but most of them should be mounted with the wings spread. This can be done within a half day after catching and before the wings stiffen, or they can be stored away indefinitely and "relaxed" as needed. To do this, slip the envelope containing the butterfly between several layers of wet cloths for 24 hours and the wings will absorb enough moisture to spread easily.

For a spreading board, get a smooth piece of double corrugated cardboard a foot or more square,—of a soft quality in which pins will penetrate easily. Cut strips of letter paper or typewriter paper in two sizes,— $\frac{1}{4}$ "x3" and $\frac{1}{2}$ "x6". With the left hand, grasp the butterfly specimen by the body with the folded wings hanging down and the feet up. Using a pair of scissors, cut off half the thickness of the body to make it thinner for mounting. When mounted, this cut will be underneath and will not show.



Lay the specimen upside-down on the spreading board with the head toward you, and fasten it down with a pin stuck through the body between the wings into cardboard. Lay one of the paper strips lengthwise over the two left-hand wings,—a long strip for a large specimen, one of the short strips for a small one. Pin down the back end of the strip behind the wings. Holding the front end of strip, pull it taut over the wings, and with a pin shift both wings forward until the back edge of the front wing is at right angles to the body. Pin down the front end of the strip in front of wings to hold them in position. Repeat on the other side with the other two wings. Let stand for a day or more until the wings are dry and set, then remove pins and strips, and store the specimen in a box. Dried specimens

which are relaxed and then spread, take only an hour or two to become dry and set.

When a good supply of spread specimens is on hand, place them in a pan of benzine or white gasoline for 24 hours to kill any parasites. Then lift them out carefully and lay right-side-up on a folded newspaper in a shallow box. Cover the box with a sheet of glass leaving a small space at each end for ventilation. Set this out in the sun for several hours until all liquid has evaporated and they are dry and brightly colored again. Then store them immediately in a large, tightly-capped can or tight box in which is placed an open jar or bottle of Carbon Bisulphide. This prevents any parasites from getting to them.

If any amount of Butterfly Art Work is to be made, a tight "fumigating box" should be built,—large enough to hold a box of butterflies, a sack of milkweed floss or thistle-down, and several magazines filled with an assortment of pressed greenery. This box should have a hinged door fastened with several catches against a folded strip of cloth or inner tube, to make it as nearly air tight as possible. Store all materials in this with Carbon Bisulphide until ready to mount. Handle this liquid carefully, keeping it out of the sun and away from fires, as it is highly inflammable.

There are a number of "bugs" which attack butterflies and moths and destroy them. One of the worst offenders is a house pest commonly called "Rug Beetle." So great care must be taken to keep out these parasites, the best method being to store all materials in a fumigating box until ready to make up desired articles. With proper precautions, a piece of butterfly work will remain in perfect condition for years.

PREPARATION OF GREENERY

Different localities provide many different kinds of ferns, grasses and flowers suitable for mounting with butterflies and moths, and hunting for them can become a very enjoyable and healthful summer or vacation occupation. They can be found almost everywhere,—along country lanes, in fields and orchards, on hills and mountains, in parks, and in one's own garden.

It is desirable to have some large, filmy grass heads for a foundation. Then hunt for small ferns, heavy grass heads, seed heads, sedges and small flowers. Lay these between the pages of old magazines, tie tightly with a cord, and place under a weight for 24 hours to press flat. On the second day, the magazines may be laid out in the sun on a warm cement walk or porch, turning them frequently, to hasten drying. After two days remove the greenery to fresh magazines and dry the first ones. It may be necessary to change them again before the greenery is perfectly dry. Then put an assortment of all the greenery into one or two magazines and store in the fumigating box.

A supply of milkweed floss or thistle-down should be gathered in season,—to make a shimmery background for the greenery,—both plants growing wild almost everywhere. The milkweed floss is easier to work with. Gather the milkweed pods or thistle heads when ripe, just before they open, and store in bags or boxes, keeping one bag in the fumigating box.

FRAMES

Almost any color frame is suitable for mounting butterflies and moths,—black or mahogany, gilt or silver, natural wood finish, green or blue tones, antique ivory or white. The plainer type is best, however, as elaborate frames detract from the beauty of the butterflies. Old discarded frames can often be resurrected from the attic or basement and restored with a coat of shellac, varnish or paint.

One thing is important,—the groove (rabbet) in the back of moulding must be deep enough to allow room for the thickness of the butterfly work. The depth of the rabbet should be not less than $\frac{1}{4}$ " for small frames, and $\frac{5}{16}$ " to $\frac{3}{8}$ " for large ones. Some mouldings are too shallow.

The frames should be fitted with good-quality, clear glass and cardboard backs. A double corrugated cardboard, even the thinnest, is too thick unless the frame rabbet is unusually deep. Frames purchased at stores are generally fitted with a thin, stiff fiberboard in the right thickness. Or large, flat boxes (shirt boxes or underwear boxes) can be obtained from stores and cut up to make frame backs. The cardboard should be only thick and stiff enough to prevent bad bulging on the back.

OTHER MATERIALS

Cotton is used for the background of Butterfly Art Work. A pound roll of absorbent cotton or part of a package of cotton comforter batt in a good grade, will make many pieces.

Also needed are a chunk of beeswax in good quality, and a small piece of galvanized iron in 24 or 26 gauge thickness. The local tin smith's shop will usually provide some scraps of this iron a few inches long in correct gauge, free for the asking.

For finishing the back of pictures, use a heavy wrapping paper. Trays should be backed with a heavier "cover paper" which can usually be obtained at a stationery store or printing shop in large sheets. A medium or dark brown tone is very good.

Higgin's Vegetable Glue,—a white paste glue,—is recommended for pasting the paper backs on the frames. It is carried in drug and stationery stores in several sizes. A small can will finish many articles.

Rubber-headed tacks in $\frac{3}{8}$ " or $\frac{1}{2}$ " size can be purchased in dime or hardware stores for a few cents, to put in the corners of serving trays.

To fasten the backs in frames, wire brads in 1" to 2" lengths and 18 to 20 gauge wire, are needed and can be bought at hardware stores or lumber yards.

PREPARATION OF FRAMES

When the frames are ready, clean the glasses and slip them into the frames. Take a piece of the galvanized iron and cut some narrow strips with a pair of tin snips, then cut these strips into glazier's points. It is best to make several widths of strips, from $\frac{1}{4}$ " to $\frac{3}{8}$ ". Holding the tin snips stationary on a bench or board, insert a strip at an angle and cut, turn strip over and cut again. Repeat, making the

"points" sharp-pointed and V-shaped, longer than the width across the top of V. If they are not perfectly flat, lay them on a piece of flat metal and tap with a hammer.

With the frame upside-down on a bench or table and braced against a strip of wood nailed along the front edge of the table, lay a "point" every 2" or 3" around the edge of glass. Hold a small screwdriver upright in left hand, pressing down on the glass with the end of it (but not too hard), and against the top of a "point." Tap against the side of the screwdriver with an old table knife or file to drive the "point" into the frame. Repeat with each "point" on one side of the frame, next on the opposite side, then on each end, driving them in far enough to clear the inside edge of frame, so they will not show from the front. This holds the glass firmly in place.

To seal the glass, place the chunk of beeswax in a pan or shallow can and melt it over a fire. When it is nearly all melted, turn out the fire, but leave it on the hot burner. Have ready an old teaspoon with the sides (halfway up bowl from tip) rolled up and over by pinching it in a vise or bending with pliers. This makes the end of the spoon a pointed tube. Dip up some melted wax with this spoon, and with the frame held tipped at an angle, pour the wax down one side into the crack between the glass and frame. Let the wax run over the edge of glass around the "points," keeping it far enough back so it will not show from the front. Continue all around the frame. It is very important to make a perfect seal, leaving no cracks or bubbles through which any "bugs" might enter to destroy the butterflies. This sealing process also makes serving trays tight for serving, so that no spilled liquids may reach the butterfly center. If the wax accidentally runs over onto the outside of frame, scrape with a knife, then wipe off with a heated pad of cloth.

ARRANGING CENTERS

Cut a piece of white paper the same size as each cardboard back and fasten together with a dab of paste. Then cut a very thin layer of cotton to fit. Either absorbent cotton or a cotton batt can usually be split several times and when laid over the white paper will show no thin spots.

Remove materials from the fumigating box and working on a clean table, arrange the milkweed floss or thistle-down on the cotton, snapping the seeds off first. The milkweed floss can be dropped on in quite a thick layer, while the thistle-down circles should be pinched flat with the fingers and pressed down on the cotton close together. Cover all the cotton with this shimmery, creamy material.

As a background for the other greenery, put on a layer of some filmy, lacy, grass sprays next, running them up unevenly within a few inches of the top. Then select several long stems of heavy grass heads or seed heads for the principal grouping, and place them off-center to right or left. All the stems should come down to the lower edge. Next put on a secondary group at the opposite end from the main group, in contrasting materials,—heavy grasses or sedges, or the finger-heads of Devil Grass or Bermuda Grass. Add some tiny yellow, blue or rose flowers, scattered along on the grasses. Work in some large fern sprays with smaller

ones across the bottom. Finish lower edge with quite a heavy row of grass heads. "Orchard Grass" is very good for this, hiding the stems of the other greenery.

When completed, lay a cardboard or pane of glass over the "center." With the forceps, pull the cotton and greenery out evenly to the edge of the cardboard and cut off any projecting stems.



ARRANGEMENT OF BUTTERFLIES AND MOTHS

Remove specimens from the fumigating box and select a group to go in each frame. The natural antennae may be used though it is difficult to keep them from breaking in the process of fastening the work in the frame. A drop of Shellac or Household Cement at the base of antennae will help to keep them in place. Or they can be removed and the black bristles from a hair or clothes brush substituted. With the butterfly upside-down, put a drop of Household Cement on the under side of head, lay the ends of two bristles on the cement, spreading the outer ends naturally, and allow the cement to dry for a few minutes.

Select your largest and prettiest butterfly or moth for the center of the group in each frame. Lay it in place, slightly off-center and at an angle,—not perfectly straight up. Perch one or two butterflies with folded wings on the tips of some of the heavier greenery heads. Add several more

specimens in a balanced arrangement, selecting those in blending colors. Do not use too many in each frame. Seven or eight in assorted sizes are sufficient for a large tray or picture.

When the arrangement is completed, pick up the frame, giving the glass a final dusting with a lintless cloth, and lay it over the work. With a hand on each side, holding the work up into the frame, turn it over, and bracing it against the stick on the edge of table, hold the back down firmly with a hand or weight, and fasten it into the frame with the wire brads placed every 2" or 3" all around. These can be laid flat on the cardboard, and while pressing down on the brad, tap the head of it with the side of an old file or chisel or some similar tool, driving it into the frame. If the brad should start to split out the back of the frame because of too shallow a rabbet or too thick a "center," cut some large "points" out of the iron,—about $\frac{3}{4}$ " long and $\frac{1}{2}$ " across the top,—and drive these in instead of the brads.

Now the article is ready for the paper back. Lay the frame on the paper, mark around it, then cut $\frac{1}{16}$ " inside line. Cover the back of the frame with the paste glue, using a small stiff brush, being very careful that no spot is overlooked. Wet the back of the paper by rubbing it with a sponge or pad of cotton dipped in water, then lay it, wet-side-down, on the article, and with a cloth rub and press it down carefully on the frame until it is perfectly set and sealed. This seals in the butterflies and moths and prevents any "bugs" from getting in to them. As the paper dries, all wrinkles and bulges will straighten out and it will be smooth and taut.

After the paper backs on the trays are dry, drive a rubber-headed tack into each corner on the back of frame,—about $1\frac{1}{2}$ " down long sides from corners. For pictures, drive a screw eye or tack on each side of the back of frame several inches from the top and connect with a string or wire for hanging.

BOOK ENDS

Have two picture frames made of moulding $\frac{3}{4}$ " wide or more,—5" x 6" outside measurement of frame (not glass size) being a good size. Fit the frames with glass, fasten this in and seal, and fill with pretty butterfly "centers." Glue paper on the backs. Have a tin smith cut two pieces of 18-gauge galvanized iron $4\frac{3}{4}$ " x 9" in size, and get them bent crosswise to a true right angle $\frac{3}{4}$ " from one end. Drill two small holes on each side of the long half, as close to the edge as possible, countersink the holes, and using tiny, flat-head screws, screw the iron to the back of the picture. Wash the three surfaces of the iron with vinegar, let stand 15 minutes, then remove with water. Cut a piece of felt long enough to go from the top of the frame down the back, over the base piece of iron and back underneath to the bottom of frame. Glue in place and trim evenly.

CALENDAR

Pretty calendars or plaques can be made without wood frames. Cut two identical pieces of heavy cardboard (smooth pieces of a cardboard carton will do), about $5\frac{3}{4}$ " x $8\frac{1}{4}$ ", or



any other desired size. With a sharp knife or chisel, cut a true rectangle about $3\frac{1}{2}$ " x $4\frac{1}{4}$ " out of one end of one piece, then glue the two pieces together, putting them under a weight to keep flat. Cut a third piece of thin cardboard from the top of a pretty box. In one end of this, carefully cut out a matching opening, but make it $\frac{1}{4}$ " smaller all around (3 " x $3\frac{3}{4}$ "). This forms a "rabbit" when laid over the opening in the heavy cardboard.

Secure a piece of clear celluloid by removing the emulsion from an old photograph film. Cook it in water to which has been added lye or strong soap powder, keeping it below the boiling point. Lay several small sticks in the pan to raise the film off the bottom,—to keep it from getting too hot. An old tooth brush is excellent for rubbing the emulsion coat off the film without scratching. When it is perfectly clear, rinse it in clean water and dry. Cut a piece of this celluloid larger than the opening in the thin cardboard, and glue it to the underside with Household Cement.

Make a butterfly picture to fit in the opening in the heavy cardboard, starting with a piece of white paper, then a thin layer of cotton, some greenery and one or two small butterflies. Place this in the opening in the heavy cardboard, glue the thin cardboard on top and weight down until set. Finish by binding the edges with Passe Partout (fancy, gummed paper tape), glue a small calendar on other end opposite butterfly picture, and fasten a ribbon or cord hanger loop to the back.

POWDER BOX

An old powder box can be given fresh beauty by making a new lid of framed butterflies. Any graceful glass or pottery bowl can also become a unique dressing table adornment by adding a butterfly top.

If the bowl or box is round, cut two circles of heavy fiber cardboard (not corrugated) about $\frac{3}{8}$ " larger than the outside top diameter. Cut out the center of one of these circles, leaving a $\frac{1}{2}$ " rim. Glue this on top of the other circle, and put under a weight until set. Make a butterfly

picture to go in the center space as was done for the calendar, using one or two small butterflies. From a thin piece of cardboard, make a third circle of the same size and remove the center to leave a $\frac{3}{4}$ " rim. Lay this on a circle of silk or satin about $1\frac{1}{2}$ " larger all around. Cut out the center of this silk $\frac{1}{2}$ " inside the opening in the cardboard, slash this $\frac{1}{2}$ " edge, fold it back and paste down on the cardboard. Clean the emulsion from an old photograph film, following the directions given for the calendar. Cut a circle of this celluloid $\frac{1}{2}$ " larger than the opening in the thin cardboard and glue it to the underside with Household Cement. With paste on the cardboard rim, lay this over the butterfly picture and turn everything upside-down. Pull the edge of the silk over taut, in evenly formed pleats, and glue it down in the center of the solid cardboard circle.

Cut two circles of heavy cardboard about $\frac{1}{8}$ " smaller than the inside diameter of the powder box top. Glue them together and cover with the same silk or satin, pulling it up taut and pasting it down in pleats on the back. With the backs together, glue this in the center of the larger circle and place under a weight until dry. Then lay the new lid on top of the bowl or box with the small circle extending down inside. If the silk or satin on the top and sides of the lid is not perfectly smooth, dampen it with a pad of cotton dipped in water, and as it dries, it will shrink perfectly taut and free from wrinkles. If the top of the powder box is square or rectangular or any odd shape, make a lid to fit it in the same way.

JEWEL BOX

The lower half of any small cardboard box will become a charming jewel box if it is padded, covered with silk and trimmed with a butterfly lid. For an attractive combination, cover the outside of the box with taffeta in a color to match bedroom furnishings, and line with white satin.

To make the lining, cut a piece of thin, stiff cardboard to fit each side and the bottom of the inside of box. Make the side pieces about $\frac{3}{16}$ " shorter and $\frac{1}{8}$ " higher than each side. The bottom piece should be about $\frac{1}{8}$ " smaller in both directions. Pad one side of each cardboard with a layer of cotton, fastening it with a few dabs of paste. Cut a piece of satin for each piece,— $\frac{1}{2}$ " larger all around. Lay one of the cardboards cotton-side-down on its piece of satin, pull the edge of the satin over taut and paste it down on the back of card. Repeat with each card. When dry, whip the ends of the side strips together with needle and thread, then whip these sides to the bottom piece. Slip this lining inside the box, fastening it with a little paste.

Next cut a piece of cardboard to fit the outside of each side of box. Make these pieces $\frac{1}{8}$ " longer and $\frac{1}{4}$ " higher than the box sides. Pad them with cotton and cover with silk. Whip the ends together, slip this cover over the outside of the box, fastening it with a little paste, and whip the top edge to the top of lining.

Make the lid similar to the Powder Box lid. Cut two rectangles of heavy cardboard and one of thin cardboard $\frac{1}{4}$ " larger each way than the top of box. Remove the center of one heavy card, leaving a $\frac{1}{2}$ " rim. Glue this to the other heavy card and fill the center space with a butterfly picture,

using 2 or 3 small butterflies. Cut the center out of the thin card, leaving a $\frac{3}{4}$ " rim. Cover this with the silk, following directions for the Powder Box, and glue a piece of celluloid over the underside of the opening. Lay this over the butterfly picture, gluing the cardboard rims together. Turn wrong-side-up, pull up the silk edge and paste it down on the cardboard back, mitering it at the corners. Cut two pieces of heavy card which will slip easily down inside the padded box. Glue these together and cover with the silk. With paste fasten this in the center of the underside of lid and place under a weight until dry.

Wooden boxes with flat, hinged lids may be glorified with a butterfly picture framed to fit the top and glued or nailed on the lid. In the same way, fasten a butterfly-filled frame on the top of a tilt-top table and have a piece of furniture which will be the envy of all your friends.

Butterflies mounted on lamp shades and shields are exquisite with the light shining through the wings of brightly-colored species. For this kind of work, use only the wings. The heat from the lamp affects the oil in the natural bodies. Break off the wings and mount them on a small piece of celluloid, $\frac{1}{4}$ " x $\frac{1}{2}$ " being a good size for medium and small specimens. Use Household Cement for this. Cut a body out of blotting paper and tint it with water colors or oil paints to match the color of the natural body. Attach artificial antennae, and cement this paper body to the celluloid between the wings. If a neat job is done, it is hard to tell from the real butterfly. Glue these with greenery on a tinted paper or parchment foundation, cover with celluloid and sew the edges to the frame of lampshade or shield. Finish with a binding of ribbon or braid.

If only small pieces of celluloid from photograph films are all that can be obtained, mount the butterflies in small circles or panels sewn on a silk or parchment lampshade, covering the edges with a fancy braid or $\frac{1}{2}$ " ribbon shirred through the center. It is not necessary to seal articles made of these artificial butterflies. With the real body removed, pests seldom attack the wings alone.

Very attractive Christmas or Easter cards can be fashioned from these artificial butterflies. Cut two thin cards in desired size. Cut an opening in the front card and back it with a piece of celluloid. Behind this "window," mount an artificial butterfly with a few sprigs of greenery on the other card, and glue the two cards together. Bind the edges or overcast with bright wool yarn.

With a little time and ingenuity, very little expense and much fun, many other lovely and unique articles can be made to grace the home, using fragile butterflies and moths as the decorative feature. The things described here are "only the beginning" of the possibilities.

This booklet has been compiled by Esther Parnell Hewlett, the "Butterfly Lady" of Southern California, who has "Butterfly Farmed" for many years, and for the past twenty years has imported the beautiful tropical butterflies and moths from the world around, manufacturing them into Butterfly Art Work. It is written with the hope that it will arouse increased interest in a fascinating subject and be of real service in helping more people to know and appreciate the wonders of Nature.

Photographs by Frank H. Hewlett.