Then I searched for help in every clime,
For peace had fled from my dwelling now,
Till I finally thought of old Father Time,
And low before him I made my bow.
"Wilt thou deliver me out of his hand,
This bald-headed tyrant from No-man's-land?"

Old Time he looked with a puzzled stare,
And a smile came over his features grim.
"I'll take the tyrant under my care:
Watch what my hour-glass does to him.
The veriest humbug that ever was planned
Is this same baldhead from No-man's-land."

Old Time is doing his work full well—
Much less of might does the tyrant wield;
But, ah! with sorrow my heart will swell
And sad tears fall as I see him yield.
Could I stay the touch of that shriveled hand,
I would keep the baldhead from No-man's-land.

For the loss of Peace I have ceased to care;
Like other vassals, I've learned, forsooth,
To love the wretch who forgot his hair
And hurried along without a tooth,
And he rules me too with his tiny hand,
This bald-headed tyrant from No-man's-land.

CARNIVOROUS PLANTS OF FLORIDA.*

By MRS. MARY TREAT.

THE pinguiculas, or butter-worts, are carnivorous plants, and closely related to the utricularias, but to a casual observer they do not at all resemble each other. The utricularias usually grow in water, and have finely dissected leaves, and little stomach-like sacs, into which small insects are entrapped, from which they never escape any more than they would from the stomach of an animal; but the pinguiculas grow on land, and entrap insects on their large broad leaves, which are converted into stomachs, when they secrete a fluid corresponding to the gastric juice in the stomach of animals. The leaves lie flat on the ground in the form of a rosette, and are always moist, and feel greasy to the touch, from which it takes both its common and scientific name—*pinguis* being the Latin for fat.

At the North we have but one representative of this genus—*Pinguicula vulgaris*—and this is scarce, growing only in a few places on wet rocks. Last summer specimens of this species were sent me from Cornell University, on which I made observations, and found it to be carnivorous, as I had been previously informed. But my material was not sufficiently ample nor in the best condition to experiment with very extensively; yet my curiosity was sufficiently aroused to impel me to visit Florida, where I could find winter-blooming species of pinguicula, which, so far as I knew, no one had experimented with.

I reached Florida in November, 1875, and soon found three species in large numbers—*Pinguicula pumila*, *P. lutea*, and *P. elatior*. They were already in a good condition to work with, the fall and winter seeming to be their growing season. *P. pumila* commenced blooming early in December, and in January the damp pine-barrens were flecked with the large bright yellow flowers of *P. lutea* and the showy purple ones of *P. elatior*.

From all appearance, these plants are annuals. They commence blooming in winter, and by the time the rainy season begins in spring, the seeds are ripening and falling to the ground; the young plants soon become established, and evidently grow slowly during the summer and fall, or until about November. I did not find a single plant of either species but what bloomed during the winter or early spring, which inclines me to the opinion that they can not be perennial. At all events, the winter, or dry season, is the time they make their most rapid growth; and we can see that during the dry season they would be much more likely to digest the prey they capture, as in late spring and summer it rains almost daily, when the insects would be washed away.

Figs. 1 and 2 represent the plant *P. pumila*. This species is less in size than the other two above mentioned, and has very small roots, barely large enough to hold the plant in place. It blooms all through the winter and early spring, constantly sending up its pretty one-flowered scapes, surmounted by a white or purple blossom, until they reach the number of fifteen or twenty. The flower scapes are from three to six inches in height, brittle and delicate; and yet the roots are so small, even when the plants grow in damp soil, that it is almost impossible to cull one of the flowers without bringing up the whole plant; and in the more exposed dry places, when a plant had several flower stalks, I have often found it tipped over, apparently blown over by the wind.

I observed the plants closely where they grew, and found a great many minute dipterous flies on the leaves, held there by the viscid exudation; but I could only know that they were of real use to the plant by repeated experiment and close observation, so I carefully removed a number of fine plants to my study.

Under the microscope the plant presents a beautiful and complicated appearance. Along the midrib and veins of the leaf are spiral threads closely coiled. Fig. 4 represents one of these spiral threads, as seen through the microscope, partly uncoiled. On breaking the leaf and pulling it carefully apart, the coils are set free, and stand out from the broken edge of the leaf.

The leaves are quite sensitive; when the plants are removed from the earth, the leaves have a tendency to curve backward until

* I am indebted to Miss FANNIE KENDRICK for all of the drawings illustrating this article, except the flowers of *P. lutea*, which were pressed specimens sent to the editor of this Magazine.

the apex touches the roots. Have these spiral threads any thing to do with this movement?

Over the outer surface of the leaves are curiously shaped hairs. Near the base are long multicellular ones, as seen in Fig. 3. The hairs gradually become shorter, have fewer cells as they approach the blade of the leaf. Scattered thickly over the blade are short unicellular hairs tipped with a gland, as seen in Fig. 5. These glands are the secretory organs.

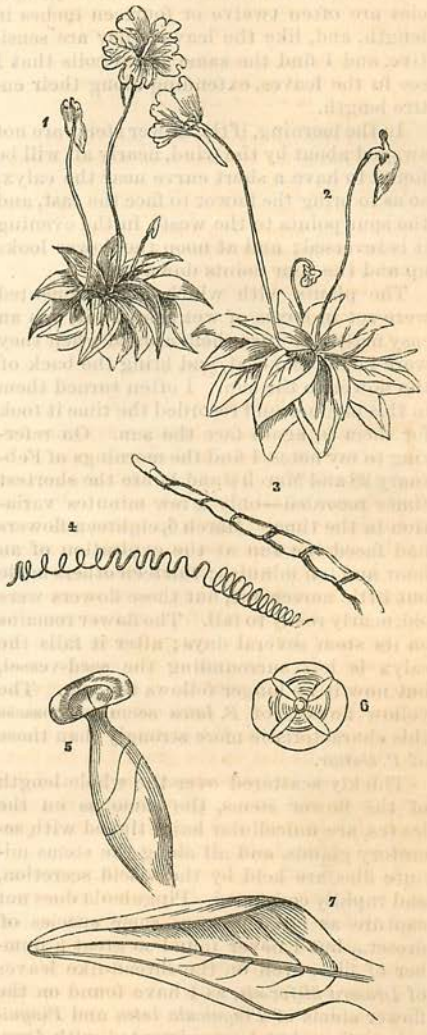
It is interesting to note the transformation of the hairs. From the long pointed ones we find every gradation before they reach the short unicellular ones tipped with perfect glands. There are other organs imbedded in the cellular tissue of the leaf, which remind me of the absorbing glands, or "quadrifid processes," found in utricularia. Fig. 6 represents one of these organs highly magnified.

I commenced experimenting with *Pinguicula pumila* in December. The thermometer stood at 80°, and it continued almost unvaryingly warm until the 10th of January. Toward noon of each day it ranged from 75° to 80° in the shade.

December 20, I placed seven house flies on as many young healthy leaves of *P. pumila*. In two hours and forty minutes the flies were bathed in a copious secretion, and in three hours and fifteen minutes two of the leaves had folded over the flies, so as to hide them from sight. The remaining five leaves had made little or no movement, but were secreting abundantly, and the fluid was trickling away from the flies, running toward the base of the leaf and also to the apex, where it was held by the natural incurvation of the leaf. The flies were now so tender that on moving them with a needle they fell to pieces. In three days the leaves were comparatively dry, the secretion had been absorbed, and nothing remained of the flies but the outer integuments. The leaves looked healthy and fresh, but they would not secrete as before.

December 25, I placed tiny bits of raw fresh beef on ten leaves of *P. pumila*. In six hours the secretion was so copious that the spoon-tipped ends of seven leaves were filled. The secretion had mingled with the juice of the beef, and looked bloody, but the meat itself was white and tender. In a little less than twelve hours the fluid had changed color; it now looked clear, and remained so until it was gradually absorbed.

On the same day I put bits of salt beef on eight other leaves, equally as fresh and vigorous as those on which I put the fresh beef, but the result was very different. The leaves secreted, but did not absorb the secretion. On the contrary, they turned brown—were killed—wherever the meat and the secretion that mingled with the meat touched them. The leaves partly digested old strong cheese, but finally succumbed and turned brown, as they did with the salt beef. I tried many other experiments with this species with various substances, and the sum of my recorded experiments shows that the plants readily digested small insects and small parts of large ones, also tiny bits of



THE PINGUICULA.

1, 2. P. pumila. 3. Multicellular hair. 4. Spiral thread. 5. Unicellular hair. 6. Gland in tissue of leaf. 7. Leaf of P. lutea.

fresh meat, and milk and fresh blood of animals.

But my main work for more than two months was on the larger species of pinguicula—*P. lutea* and *P. elatior*. Unlike *P. pumila*, both of the above species have rather large and strong roots, and are firmly fixed in damp soil. They have from twenty-five

to thirty leaves, often three inches in length, lying flat on the ground in a rosette. The leaves are all naturally incurved. Fig. 7 is an outline of a leaf of *P. lutea*, showing incurvation. Under the microscope we find precisely the same organs—spiral threads, glands, etc.—that we find in the smaller species.

The flower stems of both these large species are often twelve or fourteen inches in length, and, like the leaves, they are sensitive, and I find the same spiral coils that I see in the leaves, extending along their entire length.

In the morning, if the flower stems are not swayed about by the wind, nearly all will be found to have a short curve near the calyx, so as to bring the flower to face the east, and the spur points to the west; in the evening it is reversed; and at noon the flower looks up and the spur points downward.

The plants with which I experimented were set in boxes of wet sand, so it was an easy matter to turn them around when they were facing the east, and bring the back of the flower to the sun. I often turned them in this manner, and recorded the time it took for them to again face the sun. On referring to my notes, I find the mornings of February 28 and March 6 and 14 are the shortest times recorded—only a few minutes' variation in the time. March 6, eighteen flowers had faced the sun at the expiration of an hour and ten minutes; thirteen others made but little movement, but these flowers were old, nearly ready to fall. The flower remains on its stem several days; after it falls the calyx is left surrounding the seed-vessel, but now it no longer follows the sun. The yellow flowers of *P. lutea* seem to possess this characteristic more strongly than those of *P. elatior*.

Thickly scattered over the whole length of the flower stems, the same as on the leaves, are unicellular hairs tipped with secretory glands, and all along the stems minute flies are held by the viscid secretion, and rapidly consumed. Pinguicula does not capture as large prey as some species of drosera, but I never found so great a number of flies, even on the thread-like leaves of *Drosera filiformis*, as I have found on the flower stems of *Pinguicula lutea* and *Pinguicula elatior;* but I experimented with *Drosera filiformis* at the North, where these small flies are not so numerous. I can not see that there is any thing to attract the flies, unless it should be the bright flowers. Every warm evening myriads of tiny dipterous flies of another species are attracted by the light of the lamp, where they scorch their wings and fall to the table, so that every lamp is surrounded by dead and dying victims. In the same way the bright flowers of pinguicula may attract these tiny creatures, and flitting about the flowers, they come in contact with the moist stems and leaves, where they are held fast and consumed.

The pinguiculas are not only carnivorous, but also vegetable feeders. They consume a large amount of pollen. The long-leaved pine (*Pinus australis*) constitutes almost the entire growth of the pine-barrens, and the trees bloom while the pinguiculas are making their most rapid growth. Any one acquainted with the pines knows what a large amount of pollen falls annually from the trees. I have often seen pools and sluggish streams of water almost covered with this yellow pollen dust, and the pinguiculas growing as they do under and among these pine-trees, I naturally inferred that they must catch and retain a large amount of pollen; so bringing a lens to bear upon the plants where they grew, I found my suspicions confirmed—that a large amount of pollen was mixed with small flies. The plants were secreting copiously, but the flies might cause the secretion independent of the pollen; so, in order to be sure that the pollen was really digested, I took the staminate flowers of the pine to my study, and dusted the pollen over fresh leaves of *Pinguicula lutea*, which I had carefully grown where they should be free from any chance prey. I put the pollen on so thick that it lay in little heaps. Soon the leaves were secreting, and the pollen was gradually dissolved, and disappeared with the secretion.

Many other experiments I recorded, which I will not inflict on the reader in detail. The plants almost invariably attempted to digest every thing placed on their leaves; but the results were very different. Substances from which they could obtain no nourishment caused but a slight secretion, while all soft-bodied insects and bits of fresh meat caused abundant secretion. And even with digestible substances there was often quite a difference in the time it took to dispose of the same things. Some days the secretion was much more copious than others. This puzzled me for a time, until I found that on rainy days insects placed on the freshest leaves excited but little secretion. The drier the atmosphere, the better the plants worked. So I found by these experiments that I had a vegetable barometer, and that there was no danger of rain when the plants secreted abundantly.

The movement of the leaf is still a puzzle to me. Some leaves folded so that the two edges met over the prey, while others on the same plant, that secreted and digested equally well, made no movement.

DAY AND NIGHT.

Day is a snow-white Dove of heaven,
That from the east glad message brings:
Night is a stealthy, evil Raven,
Wrapt to the eyes in his black wings.

T. B. Aldrich.

premises being overturned, her theory falls to the ground. The mistake of forty years ago can never be set right now; but the mistake of to-day must, at least, be rectified. And so Aunt Rhodanthe, prompt in all things, writes her letter, and dispatches it, directing it, as she did the other one, to "Dr. Ralph Dormer." This letter, however, does not fail in reaching its destination, for, just as Aunt Rhodanthe is saying to Bessie, "I have written to Ralph Dormer, and I think that he will be here in the course of the day," a step is heard in the hall—a step which sends the bright blood flushing up to Bessie's forehead.

Miss Rhodanthe disappears, and Bessie goes shyly forward to meet Ralph, but finds herself caught up unceremoniously in two strong arms, while a voice whispers, "Can you forgive me, Bessie, for all the hard things I have thought of you, and for all I have made you suffer?"

It is turning the tables with a vengeance, for Bessie has thought that she was the one to ask for forgiveness; but she accepts the situation with a good grace, understanding that Aunt Rhodanthe's explanation has been ample enough to spare her the pain of confession.

"As far as I understand it, neither of you has much cause to pride yourself on your behavior in the matter," Aunt Rhodanthe says, afterward. "Here have you both been thinking exactly the same things of each other, and making idiots of yourselves for months, when a dozen words would have set the whole thing straight. There *are* times in life when 'silence' is any thing but 'golden.' I suppose I am hardly the one to reproach you for it, though," says Aunt Rhodanthe, with a half sigh, as she thinks of the forty years which lie behind her.

Dr. White is gathered to his fathers now, and his partner, Dr. Dormer, reigns in his stead. Dr. Dormer's wife will never shrivel and fade into the likeness of Aunt Rhodanthe; for the light of happiness which went out so early for the elder woman, still shines brightly over Bessie Dormer's life, and is softly mellowing her to a ripe and fair maturity. When Bessie is sixty, you will find it even harder than you do now to believe that Bessie in youth, as far as looks went, was simply Miss Rhodanthe over again.

CARNIVOROUS PLANTS OF FLORIDA.

By MRS. MARY TREAT.

[Second Paper.]

EARLY in March the new leaves of the pitcher-plant (*Sarracenia variolaris*) begin to make their appearance, and soon after, the large yellow flower, with its drooping petals, is very conspicuous every where on the damp pine-barrens of Florida. It is one of the most remarkable of all our insectivorous plants, and destroys by far a larger number of insects than any carnivorous plant with which I am acquainted. The leaves are from six to twelve inches in length, hollow, and trumpet-shaped; they stand very erect, and the opening is covered by a rounded arching hood. Just below the hood the leaf is spotted with pure white, and these spots are surrounded by bright scarlet veins. The inner surface of the hood is lined with brilliant colors: finely reticulated veins of scarlet run over a yellowish ground. A broad wing extends along one side of the leaf from the base to the opening at the summit; the wing is bound or edged by a purplish cord, which also extends around the opening. This cord or edge of the wing is one of the most wonderful features of the plant. The flower stem is much longer than is shown in our engraving.

From observations taken on the ground where the plants grew, I found innumerable insects were attracted to them. The flaunting yellow flower may lure many moths and butterflies to the plant, but the flower is not the attraction after they reach it. This cord that runs along the edge of the wing secretes a sweet fluid, and as the wing reaches to the base of the leaf, insects that crawl on the ground as well as those that fly are attracted to this sweet secretion. I noticed on some of the plants a line of small ants extending from the base of the leaf to the summit, feeding on the secretion; so numerous were they that they crowded each other, but all steadily advancing to the opening, down which they disappeared.

All persons who have observed ants feeding have probably noticed the regular order in which they move to and from their food. The aphides (plant-lice) produce a sweet secretion of which the ants are very fond. Linnæus, with his fertile imagination, called the aphides the ants' cows. The ants are very friendly toward the aphides, for they supply them with abundant food, on which they thrive. Now if we observe the ants feeding on this secretion from the aphides, we can also see that they form two regular lines, the hungry ones moving up the stem to take their food, and the satisfied ones returning down the stem; and very friendly and fraternal they seem, never getting in each other's way, but often greeting one another as they meet, putting their antennæ together as if communicating something, and then they pass on, each his own way.

THE PITCHER-PLANT (SARRACENIA VARIOLARIS).

Mark the difference when the ants are found feeding on the sweet secretion of *Sarracenia variolaris:* now they crowd and jostle one another, and seem wild in their movements, and all are advancing in one line toward the summit of the leaf, on reaching which they disappear down the wide throat of the insatiable sarracenia. No return line here.

This I observed on the pine-barrens where the plants grew. I now took a large supply of leaves to my study, and placed them in an upright position in vases of water to keep them fresh, and opened the windows to admit the various insects that are swarming in the air at this season. Soon the room was well supplied with the common house fly. I now returned the screens to the windows, and sat down to watch results. A number of flies were soon attracted to the plants, and almost as soon as they tasted the secretion they acted strangely. It was astonishing to see how quickly it affected them. They became stupid, and did not notice my hand in close proximity, and they paid no attention to gentle efforts to shake them from the leaf. If I touched one, it would fly a short distance, but invariably it returned to the leaf, and very soon was buzzing inside of the tube, trying to walk up the dry, smooth surface, and ever falling back, until it was exhausted and still. It was no use to liberate them. I repeatedly took a leaf and turned the opening downward, and gently knocked it until I liberated half a dozen or more, but they were soon on the leaves again, evidently trying to straighten themselves. They would pass their legs over their wings, but they were unsteady on their feet, and seemed to be intoxicated. Every fly that I liberated eventually returned to the open mouth and walked in, as if fascinated by some spell.

In about two hours the room was cleared of flies—all lured into the fatal traps. I re-opened the windows to admit more, and among the flies came two or three yellow-jackets—wasp-like insects. These yellow-jackets are very fond of any thing sweet, and very soon one found the tempting bait. It alighted upon a leaf, and commenced feeding about two-thirds of the way from the base. It seemed to relish the food highly, and ate eagerly and quietly for a few moments; but soon its wings began to flutter, and it proceeded hurriedly and wildly along the line of sweet until it reached the opening. Here it paused a moment to feed along the cord that surrounds the mouth of the tube, but its wings were still raised and fluttering. In a little more than a minute from the time it alighted, it was a safe prisoner within, buzzing and fluttering and stirring up the imprisoned flies. On holding the leaf up to the light, I could see its frantic efforts to escape—trying to climb the smooth surface, but, like the flies, ever falling back, until it was powerless to move.

These experiments I repeated day after day. As the leaves became exhausted, I brought in fresh ones.

I have been asked by an eminent scientist if I can *prove* that the flies are intoxicated. I do not see how I can prove it. I am not a chemist, and can not analyze the secretion. I can only give the result of my observations and experiments. I might get a large quantity of the leaves and make a decoction of the secretion and drink it; but I find the flies never recover from their intoxication, and my fate might be the same if I took a sufficient quantity. At all events, the secretion excited the salivary glands to a wonderful extent, which continued for hours after I had tasted it. The sweet taste

was succeeded by a disagreeable acrid feeling, the same as that produced by the Indian turnip (*Arisæma triphyllum*), only in a milder form.

I called the attention of a lady friend—Mrs. Read, a good observer—to this strange behavior of the flies; and she is of the same opinion as myself, that the flies are made stupidly intoxicated before entering the tube. We also placed vases of leaves in the dining-room and kitchen, where the rapid disappearance of the flies highly amused the servants.

Upon opening the leaves, a day or two after they were brought into the house, I often found fifty or more flies in a single leaf. Of course a leaf could not digest such a mass of insects before they became putrid.

I carefully studied the inside structure of the leaf. More than half of the tube from the base up is lined with a firm, strong texture, and this lining is of a livelier green color than the remaining inner surface of the tube. On passing a finger over the surface from the base upward, we can detect a slight roughness as far as the brighter green color extends, and then it abruptly terminates; above this is a space of about two inches or more, according to the length of the leaf, which has a peculiar smooth feeling, and over this space no intoxicated insect can walk. There is no gradual blending of the two colors from the base up, but the line is distinct and marked, and easily seen with the naked eye. The smooth lighter-colored space is succeeded by the white spots before mentioned, and these white spots gradually blend with the fine scarlet veinings on the inner surface of the hood. The peculiar smoothness does not extend over the bright colors, and here a fly can easily walk.

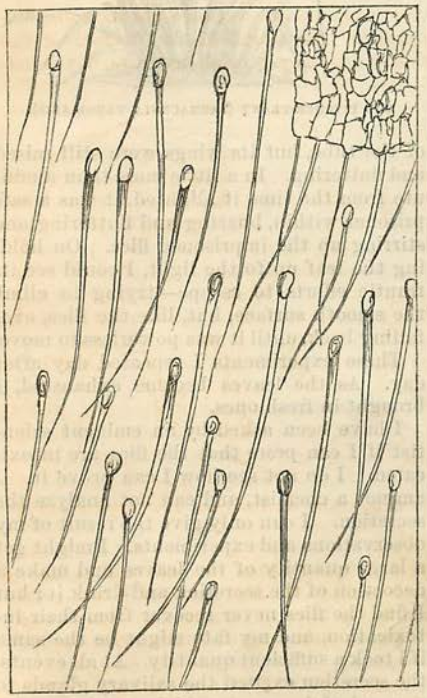


FIG. 1.—HAIRS ON ABSORBING GLANDS FOUND IN THE LOWER HALF OF TUBE.

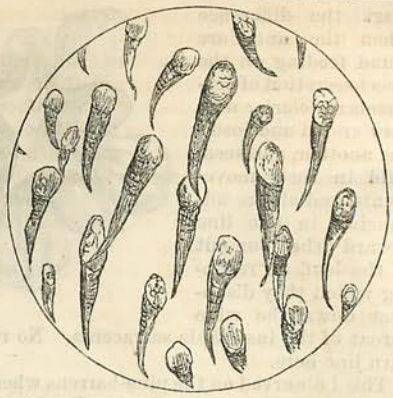


FIG. 2.—HAIRS ON THE SPACE ADJOINING THE OPENING IN THE MOUTH OF THE TUBE.

Under the microscope, the two colors on the inner surface of the leaf present a marked difference; the lower part of the tube seems to be a true stomach. Long hairs (Fig. 1) all pointing downward are scattered thickly over the surface. If a leaf has caught no prey, the hairs are clear and very transparent; but very soon after an insect is caught, the hairs begin to absorb, and granular matter may now be seen extending along their entire length. When a small number of insects are caught, they seem to be digested quickly, and no disagreeable odor is detected; but, on the other hand, when a large number are caught, which is usually the case, a disgusting odor emanates from the tube. Yet this filthy mass does not injure the inner surface of the tube; it is evidently absorbed, and, no doubt, goes to nourish the plant. So this sarracenia, like the disgusting buzzards in the animal kingdom, feeds on carrion, and as it can not go in search of food, a tempting bait is set to lure insects into the fatal trap.

On the lighter-colored smooth surface, immediately above the long hairs, the microscope reveals very short hairs, as seen in Fig. 2. In pinguicula and other plants which I have observed, when two sets of hairs are found, they gradually blend into each other; but here a distinct line is drawn that can easily be seen with the naked eye, and close to this line the hairs are as distinct and marked in their character as on any part of the surface. On the inner surface of the hood and around the mouth of the tube is another set of curiously shaped hairs

(Fig. 3), which creates a roughness, and over which the flies can easily walk.

The structure of the cord which secretes the sweet fluid presents a marked difference, under the microscope, from the rest of the plant. The epidermis is very thin here, and the secretory glands are large and numerous.

The plant secretes the sweet fluid only a

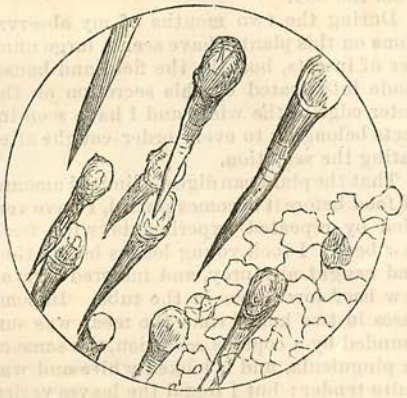


FIG. 3.—HAIRS ON THE INNER SURFACE OF HOOD.

few days, while the leaves are young and vigorous, and it is while this secretion is abundant that so many insects are caught. Yet even after I can not detect the secretion, either in feeling or taste, the flies still find enough to attract them, but it is in such small quantity that they sometimes fly away after feeding a while, which they never do when they get a good dose. I have taken flies that were stupidly intoxicated, and placed them under a glass where I could observe them, and I find they have a tendency to stand on their heads until they die. The first flies that are caught in a tube usually remain quiet, from the fact that they are wedged down so tight that they can not move. This tendency to stand on their heads puts them in such a position that it is impossible to extricate themselves; but as the tube extends upward it becomes broader, and now the remaining flies that are caught are no longer wedged in, and these try to climb the smooth surface, but, as far as I have observed, not one has ever succeeded.

It is not only house flies on which the secretion acts, but all insects which I have noticed are affected by it. A large cockroach was feeding on the secretion of a fresh leaf which had caught little or no prey. After feeding a short time it went down into the tube so tight that I could not dislodge it, even when turning the leaf upside down and knocking it quite hard. It was late in the evening when I observed it enter; the next morning I cut the tube open, the cockroach was still alive, but it was covered with a secretion produced from the inner surface of the tube, and its legs fell off as I extricated it. From all appearance, the terrible sarracenia was eating its victim alive. And yet, perhaps, I should not say "terrible," for the plant seems to supply its victims with a Lethe-like draught before devouring them.

From the position in which the insects are placed after being made prisoners, it is impossible to see how much secretion they cause. In the case of pinguicula this is easily seen. On cutting the tube of sarracenia open, we find a secretion very different from the sweet secretion in the cord, and this secretion produced from the inner surface of the tube seems to act on the flies in the same way as that produced by pinguicula.

As further evidence of the intoxicating power of the sweet secretion of sarracenia, I must add the fact of a wasp building its nest within the fresh young leaves, usually before the leaf has caught a single insect. The nest is made of dry fibrous material—probably stripped from some dead herbaceous plant—and dry grass. This material is crowded as low down in the tube as the wasp can go, and it extends upward to the depth of an inch or more. On this bed is laid the food for the young wasp. The food consists of five or six young grasshoppers, which the parent wasp has stung and paralyzed in such a manner that they are kept alive for the young wasp to devour. The grasshoppers are covered with the same material as that found in the bottom of the nest, to the depth of about an inch, the ma-

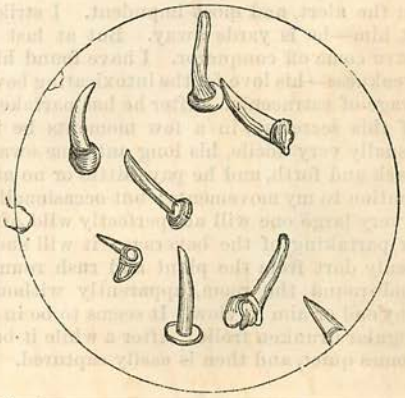


FIG. 4.—HAIRS ON THE WING AND OUTER SURFACE OF TUBE.

terial being wadded in close and tight. I have also found the nests of a leaf-cutter bee in the tube of sarracenia. These nests I sent to Professor C. V. Riley for identification.

I give here Professor Riley's account of the nests, and I also take this opportunity to acknowledge his kindness in aid-

ing me in various ways in my researches, and especially in his excellent and very accurate drawings of the chironomus and mosquito larvæ, in the February number (1876) of *Harper's Magazine*, in the article on utricularia.

"The nest made of leaves belongs to a leaf-cutter bee, genus *Megachile*. The species can not, of course, be determined except by breeding. These insects normally build their nests in burrows which they make in the stems of soft pithy plants, like elder, and the appropriation of the sarracenia tube is very interesting. It is very likely that this bee aids pollination of the flower, and partly stores her cells with it (the pollen). In the example you send, the plant had already captured some insects before the bee commenced building. I hope to breed the imago, as I think one cell contains the larva. The leaves employed seem to be oak. The other nest is that of some wasp, and evidently of some species belonging to the *Sphegidæ*. These insects all sting their prey and paralyze it, and make their nests in various ways, but generally by burrowing in gravelly soil or appropriating the tunnels of other species, such as the carpenter-bee (*Xylocopa*). Mr. F. Smith, of the British Museum, records that *Sphex lanierii*, Guerin, 'constructs its nest of a cottony substance, filling a tunnel formed by a large curved leaf.' I have been trying to determine what the fibrous matter is composing the nest you send: it seems to be made of the slivers of some soft-stemmed plant."

Now in what way can we account for the safe exit of the wasp and bee except on the hypothesis that they did not feed on the secretion while building their nests? I have repeatedly seen wasps and other hymenopterous insects eat the secretion, and then go into the tube and never return.

But the most conclusive proof of the intoxicating power of the sweet secretion of sarracenia is the marked effect it produces upon the cockroach. The Florida cockroach is one of the most agile of insects. It is almost impossible to catch one. He is ever on the alert, and most impudent. I strike at him—he is yards away. But at last I have come off conqueror. I have found his weakness—his love for the intoxicating beverage of sarracenia. After he has partaken of this secretion, in a few moments he is usually very docile, his long antennæ sway back and forth, and he pays little or no attention to my movements; but occasionally a very large one will act perfectly wild after partaking of the beverage; it will suddenly dart from the plant and rush round and round the room, apparently without any end or aim in view. It seems to be in a regular drunken frolic. After a while it becomes quiet, and then is easily captured. I have just taken such a one and measured it. From the tip of its antenna to the end of its wings, which extend slightly beyond the body, it measured four inches in length. Its body is about two inches long. I shut it in a box overnight. In the morning it could move its legs and antennæ very slightly, but it did not recover after being taken from the box.

During the two months of my observations on this plant I have seen a large number of insects, both in the field and house, made intoxicated by this secretion on the outer edge of the wing, and I have seen insects belonging to every order caught after eating the secretion.

That the plant can digest a limited amount of food before it becomes putrid, I have verified by repeated experiments with fresh raw beef. I took young leaves before they had caught any prey, and inserted bits of raw beef low down in the tube. In some cases in two hours' time the meat was surrounded by a copious secretion, the same as in pinguicula, and it looked white and was quite tender; but I found the leaves varied considerably in the power of digestion: in some cases, at the end of two hours, the meat had not changed color, and was not acted upon by a secretion, but remained quite dry. From some of the leaves I cut a small slice from near the base of the tube, and inserted the meat, so as to watch the effect produced by the secretion. In the larger number of leaves the secretion acted upon the meat precisely as it did in pinguicula. Usually in about twenty-four hours the meat was very white and tender, and had no disagreeable odor.

But no doubt the plant receives its greatest benefit from the large amount of insects caught, and which become disgustingly putrid. When pinguicula and drosera get more than they can digest, the leaves succumb—die in the effort to digest it. Not so with the sarracenia: it seems to thrive on this filthy mass of putrid insects, and in time absorbs all save the dry remains of the wings of beetles and other hard parts of the bodies of insects.

I am indebted to Dr. D. G. Beatty, of Baltimore, for the very accurate illustrations of the different kinds of hairs found on sarracenia.

GERMAN LOVE SONG.

Thou art the rest, the languor sweet!
Thou my desire! thou my retreat!
I consecrate my heart to thee,
Thy home through all eternity!

Come in to me, and shut the door
So fast that none shall enter more;
Fill all my soul with dear delight;
Oh, tarry with me day and night!