

Canor, but having only the fruit I delayed naming it till I secured the flowers. — MARCUS E. JONES.

NOTE.— Since writing the note on *Malvastrum coccineum*, further correspondence leads me to believe that the large number of sheep lost by Mr. Ruble was caused largely, if not wholly, by poisonous water oozing out of an embankment in the midst of a large patch of *Malvastrum*. I am glad to be able to add this item of evidence in favor of the plant. There are, however, a number of other complaints about this plant yet to be settled. — M. E. J.

THE FLORA OF ST. CROIX AND THE VIRGIN ISLANDS, by Baron Eggers. — This is No. 13 of the Bulletin of the U. S. National Museum and is quite a thick pamphlet, containing 133 pages. Some 21 pages are devoted to a general description of the position, geology and climate of the islands, with remarks upon the characteristic plants. The vegetation is divided into four groups, called the "littoral," the "shrubby," the "sylvan," and the "region of cultivation." The author comes to the conclusion "that at a former period all the West India islands have been connected mutually, and perhaps with the American continent also, during which time the plants in common to all the islands, as well as to the West Indies and the continent, have expanded themselves over their present geographical areas, at least as far as they are not possessed of particular faculties for emigration over the sea."

Then follows a catalogue comprising 1,013 species of phænogamous and vascular cryptogamous plants, of which 881 are indigenous and 132 naturalized. The proportion between Mono- and Dicotyledonous plants indigenous and naturalized is 1 to 5.8; in the indigenous ones alone 1 to 4.9, thus showing the plurality of the recently introduced plants to have been Dicotyledonous. Five new species are described one of which is a *Rhus*. One looks in vain for the familiar heading *Compositæ* and hardly recognizes it under the form of *Synanthereæ*. It seems strange also to see all the grasses and sedges put before the *Liliaceæ* and the other kindred families, making the highly specialized Orchids the last of Phænogams. The entire absence of all Ranunculaceous plants is a noticeable feature to workers in our more northern flora.

The report is an interesting one in more ways than can be mentioned in a brief notice and is well worth a careful study.

MOTHS ENTRAPPED BY AN ASCLEPIAD PLANT (PHYSIANTHUS) AND KILLED BY HONEY BEES.—Towards the last of September, Mr. John Mooney, of Providence, an observing man, brought us a stalk of *Physianthus albens*, an Asclepiad plant originating in Buenos Ayres, with the bodies of several moths (*Plusia precatonis*) hanging dead by their proboscides or maxillæ. It was found that the moths had, in endeavoring to reach the pollen pocket, been caught as if in a vise by one of the opposing edges of the five sets of hard horny contrivances covering the pollinia. A few days after, Mr. Everett A. Thompson,

of Springfield, Mass., wrote us, that he had a plant of the same species which had caught a number of moths of several species, and that in some cases only the heads and tongues of the moths were left, and he attributed this dismemberment to birds, but wrote in the same letter that his father had seen bees sting the moths while alive and struggling. He sent me one of the moths, which proved to be a *Plusia precatioris*, the same species as we had observed in Providence, and a honey bee (*Apis mellifica*) which had been seen by his father to attack the moths, and which had a pollen mass of the same plant attached to one of its fore legs. On writing Mr. Thompson that his father's observations were quite new, the hive bee not being known to be carnivorous, beyond its well-known habit of stinging and killing the males of its own species and the bee moths invading its cells, his father, Rev. L. Thompson, of North Woburn, Mass., a careful observer, kindly prepared the following statement:

"I cannot undertake to give an account of my observations of the plant, moths and bees, concerning which inquiry is made, from the standpoint of a scientist, which I do not claim to be, but after pretty close watching, continued for many days, I feel quite confident of the general correctness of the following statement:

"Early in September, of the present year, as I made one of my daily visits to the plant, to me unknown before, the *Physianthus albens*, or Arauja, I noticed among the many moths that had been caught in the flowers, a considerable number of tongues still in the traps, while all, or nearly all, else belonging to the recent captives had disappeared. While I stood gazing, my attention was arrested by two or three bees buzzing immediately around as many entrapped moths that were alive and struggling to get away. Every moment or two, the bee suddenly and furiously darted upon the prisoner and seemed to sting it despite its desperate efforts to escape. The onset was generally instantaneous, but was repeated again and again, and, after the moth became still and apparently lifeless, the bee settled upon it, and, if my eyes did not greatly deceive me, began to devour it. I had previously noticed the tongues but supposed the bodies of the moths had been eaten by birds, though I had not actually seen it done. I cannot therefore positively assert what seemed to me the fact at the time, though I had no other thought, and the fact that so many of the moths had actually disappeared, leaving only their tongues, and, in some cases, other fragments of their bodies, in the shape of legs clinging to bits of casing or skin, satisfied me that the bees had really feasted on animal food as well as upon the nectar of surrounding flowers.

"I did not suppose it to be the honey bee at the time, but a kind of wasp, such as or similar to that whose nest I had sometimes found in sodded banks or terraces and looked upon as an architectural wonder. Yet I did not examine it, and can only say that I saw many, or supposed I did, upon a bed of *Nasturtiums* and other flowers, a few feet distant from the *Physianthus*.

"I think I have found as many as three or four different kinds of

moths upon the plant, besides numerous small black flies which, unlike the moth, go down *bodily* into the flower.—L. THOMPSON.”

“*North Woburn, Oct. 29, 1879.*”

Upon writing Dr. Hermann Muller in reference to these facts, he replied as follows:

“Lippstadt, Nov. 10, 1879.—*Physianthus albens* has been observed by Delpino as being visited by humble bees and fertilized by their proboscis. It is a new and very interesting fact that *Plusia precatationis* is caught by the flowers of this plant and has been found dead suspended by its proboscis. About carnivorous habits of bees, my brother Fritz, in south Brazil, has observed that honey bees (but I do not remember for the moment whether *Apis* or stingless Brazilian honey bees) licked eagerly the juice dropping from pieces of flesh which had been suspended in order to be dried in the open air. Nothing else as far as I know has ever been published on the carnivorous habits of bees; I hope, therefore, you will soon publish your very interesting observations.”

We have also received the following letter from Mr. Darwin, dated Down, Beckenham, Kent, Nov. 23d. “I never heard of bees being in any way carnivorous, and the fact is to me incredible. Is it possible that the bees opened the bodies of the *Plusia* to suck the nectar contained in their stomachs? Such a degree of reason would require repeated confirmation and would be very wonderful. I hope that you or some one will attend to this subject.”

We have also received the following note from Prof. Gray in reference to the subject: “It has long been familiar, and must several times have been recorded, that moths or butterflies and other insects are caught by getting their tongue, proboscis or legs into the chink between adjacent wings of the anthers in *Physianthus* or *Arauja albens*, and *Asclepias*, etc. The anther-wings are very rigid, the groove between them narrows gradually upwards, so that when a leg or proboscis is engaged, an upward pull only fixes it more securely, and the unhappy insects seem rarely to pull backward or downward, which is the only way to get disengaged. As to the rest of your account I know nothing; and should say that the observations need, if not ‘repeated confirmation,’ at least some confirmation by an entomological observer.”

It appears from the fact that the single worker bee received had a pollen-mass attached to one of its fore legs, that it visited the plant originally for the sake of its nectar. For what purpose did it attack, kill the moths and, as it is claimed, “devour” them? We publish the observations of Mr. Thompson and the comments upon them, with the hope that the subject will receive attention next summer.

Since this note has been put in type, Prof. A. J. Cook, of the Agricultural College of Michigan, well known as an apiarian of experience, informs us that *within the hive*, honey bee workers in killing the drones tear them in pieces with their mandibles rather than sting them, and that he has seen them thus kill a humble bee that had entered the hive; it thus appears, what we judge will be quite new to

entomologists, that the honey bee uses its mandibles, at least on some occasions, as weapons of attack, quite as much as the sting; this would also corroborate the exactness of Mr. Thompson's observations. —A. S. PACKARD, JR., in *Am. Naturalist*.

BURSTING OF THE FRUIT OF *EUPHORBIA COROLLATA*. —Mr. E. E. White, of Lincoln, Iowa, has noticed the bursting of the pods of *Euphorbia corollata*, with a report loud enough to be heard across an ordinary room. An entire plant had been brought into the house with the view of saving the seed and the reports soon took place. This note is given not so much with the idea that this bursting is peculiar to *Euphorbia*, but that it may call out similar observations and thus group them together in a tangible shape. —PROF. WM. C. WHITE.

CHARACÆ. — For the benefit of several subscribers who have expressed a desire to know something of the structure and position of *characæ*, we take from B. D. Halsted's paper upon the "Classification and Description of the American Species of Characæ" the following description :

The members of this distinct group of Cryptogams are all filamentous, submerged, aquatic plants, to the naked eye either green or ashy gray in color, depending upon the presence or absence of a calcareous incrustation. The plants are attached by a long, colorless, root-like structure to the muddy bottom of the pond or stream in which they grow, and often form dense masses varying according to the species from a few inches or two to three feet in height. They are remarkable for their large thin-walled cells and the cyclosis of their contents.

In number there is something over a hundred species.

Development:—At the upper end of the spore there is first produced by division a thin-walled, hemispherical shaped cell. This cell soon divides into two by a cell-wall parallel to the longer axis of the spore. Both of these new cells increase in size and push themselves out between the separating ends of the fine enveloping spirals, one turning downward to become the primary rhizoid, the other upward to form the proembryo. The proembryo, the upper portion of which is green, consists of but a few alternating nodal and internodal cells. When the Chara plant develops, one of the disc-shaped nodal cells divides up first into two, and afterwards, by successive divisions, into a number of cells, the largest one of which becomes the initial cell, or *punctum vegetationis* of the future plant. From this cell by further growth and repeated cell divisions the Chara plant is developed.

Antheridia (globules):—These, the male organs, are situated on the leaves and are often of an orange color, and from .50 to .75 mm. in diameter. The wall consists of eight cells called shields, closely joined by their serrate edges. The four basal ones are somewhat four sided; the upper four triangular. From the center of each shield-cell there projects into the interior of the antheridium an oblong cell called the manubrium. Each manubrium is surmounted by



Packard, A. S. 1880. "Moths Entrapped by an Asclepiad Plant (*Physianthus*) and Killed by Honey Bees." *Botanical gazette* 5(2), 17–20.

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