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Zoology

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seen. Delphinium may be considered the highest and latest developed type of the three, and *D. consolida* would seem to be of later origin than *D. tricomé* and others. Aconitum may be a stage between Delphinium and Aquilegia.

The history of these different structures, the spur, the automatic filaments, etc., offers a very attractive field of investigation. The Ranunculaceæ, on account of their wide distribution, great numbers and variety of forms, seem especially favorable for studying this branch of vital dynamics.—*J. E. Todd, Tabor College, Iowa.*

BOTANICAL NOTES.—The process of fertilization of the tulip by Halictus bees is described in the *American Entomologist* for June, by W. H. Patton, who questions whether the nectar is poisonous, as stated in Miss Stavelly's "British Insects."—The fertilization of *Cobæa penduliflora* of South America is effected, says A. Ernst, in *Nature*, by large Sphinx moths, and no flower gave a fruit without having its stigmata pollenized by crossing, self-fertilization being therefore excluded; he also confirms Bonnier's statement that the nectar is of no direct advantage to the plant.—In this connection may be mentioned the excellent treatise of Mr. William Trelease on nectar, its nature, occurrence and uses, which appears in the report on cotton insects issued by the Agricultural Department, and which we notice in another place.—Dr. H. Müller continues in *Kosmos* (iv, Heft 4, July, 1880) his series of papers on the relation of Alpine flowers to the theory of the production of flowers.—Dr. Eberth describes a Bacillus which he claims caused the death of a badger, the bacilli appearing to actively excite inflammation, the animal dying after a few days' illness, showing no other symptoms than decrease of appetite and weakness. The disease germs appeared in the liver, sections of the capillaries being crowded with them.—Mr. W. T. T. Dyer contributes to Trimen's *Journal of Botany* an article on *Lattakia* tobacco, which owes its flavor to being smoked with the wood of an oak, *Quercus ruber* var.

ZOÖLOGY.¹

A NEW HARVESTING ANT.—We have a true harvesting ant, it appears, at our very doors. In Vineland they are on every street, in every yard. At Island Heights, Ocean Grove, also, and Asbury Park, they are very numerous. A very large colony may be seen on the lawn opposite the Arlington House, at the former place. I have not looked for them farther north, but have no doubt they will be found generally in our latitude.

It is a small ant, the worker being about a line long. It is of a red-

¹The departments of Ornithology and Mammalogy are conducted by Dr. ELLIOTT COUES, U. S. A.

dish-brown color. The head is rather large. The head of the soldier ant of this family is a marvel for size, being many times larger than the abdomen. It is not above working when necessary, but is not commonly seen on the surface. It appears to rule its community, and certainly furnishes the brains of the family, in bulk, at least. In battle it is a very Ajax. It is a ferocious, murderous warrior. A war between them is a terrible thing in a small way. They cut each other in two and yet continue to fight. I have on my table, now, a pair whose abdomens have been cut off just back of the posterior pair of legs, so that they run about without any apparent embarrassment. A few moments since I placed them near each other. They gave every sign of undiminished rage and courage and flew at each other as if in the best condition. And, as I write, one of these bodiless heads is actually walking off with the other. These unconquerable contestants were taken from formicaries about fifty feet apart. Under a good objective these heads exhibit the characteristic striæ of *Pogonomyrmex crudelis* Forel, as I am informed by Mrs. Treat, an excellent authority.

The males and females are several times larger than the workers. I should think the female would outweigh forty of the little fellows. Though bothered with wings, the females are at this moment diligently excavating, in a small artificial formicary in which, as yet, I have placed no soldiers, but workers and females only. I have made many interesting notes concerning these strangers, which I may hereafter give to the public. I have sent specimens to Dr. Forel, who informs me that they belong to a variety of *Pheidole pennsylvanica*.

The rejected husks of seed carried out and piled up by their doorways first called my attention to them and revealed to me their character. It would seem that they do their house cleaning in the latter part of June, to be ready for harvesting the new crop of grass and other seed now ripening. Here and there, however, a careful eye may detect signs of some later work in husks just brought from below. Grass, clover, sorrel or other seed put near them will be seized and carried below with evident eagerness.

They have a violent antipathy to the little yellow ant—the pest of the pantry—a fact which may be used in recognizing them. Place a piece of cake full of the yellow ones near any formicary supposed to belong to the harvester and, if the supposition is correct, you will have the pleasure of seeing the big-headed soldiers rushing out with gaping mandibles eager to crush the tiny foe, and prevent the threatened invasion.—*Rev. G. K. Morris, Vine-land, N. J.*

BUDDING IN FREE MEDUSÆ.—In a review of Packard's Zoölogy by J. W. F. in the August number of the NATURALIST, the following passage occurs: "On page 60 the author says, 'Budding