

other species, *B. coerulescens* and *B. Boryanum*. The results have to do not merely with the genus studied but with the whole subject of fertilization. The trichogyne of *Batrachospermum* is found to be a cell entirely distinct from the so-called carpogonium, as witnessed by its well-organized nucleus and its chromatophore. The antherozoids also contain a chromatophore derived from the vegetative cells, and a distinct nucleus. In the act of fertilization the antherozoid and trichogyne walls fuse, a larger or smaller opening is developed, and cytoplasmic fusion occurs, but the antherozoid and trichogyne nuclei remain distinct, apparently indifferent to the process, the antherozoid nucleus for the most part not even entering the trichogyne. As soon as cytoplasmic fusion occurs the trichogyne becomes separated from the carpogonium by the gradual drawing apart of the cell-contents until the connecting strand becomes so thin that it breaks, and by a deposit of substance similar to cell-wall material. The carpogonium subsequently gives rise to the spore-producing filaments. The nuclei of the antherozoid and of the trichogyne were repeatedly observed in various stages of fragmentation after fertilization had been accomplished. The striking results are the distinct cell-nature of the trichogyne, and the process of fertilization, consisting as it does of fusion which does not involve the nuclei. That all fertilization hitherto observed involves cytoplasmic fusion as well as nuclear is well-known; but that it should be so modified as to involve the former and not the latter is entirely unexpected. It is not necessary to conclude that nuclear fusion may not be an essential feature of well-organized fertilization, for these observations upon *Batrachospermum* may indicate, as Dr. Davis suggests, that the genus is losing its sexual habit, and is tending toward apogamy. Even if this be true, however, the puzzling feature still remains that the carpogonium will not produce its fertile filaments, as clearly shown by experiments, without the antherozoid contact. It is evident, therefore, that the fusion, even if the nuclei are not concerned, shows its sexual character in its effect. The author also suggests the hypothesis that sexual reproduction in these low forms may not of necessity involve nuclear fusion. We certainly know too little concerning the behavior of the nuclei in the sexual processes of the thallophytes in general, and concerning the whole trichogyne subject in particular, to venture upon much generalization concerning these very interesting and important observations upon *Batrachospermum*.

## BRIEFER ARTICLES.

Some new or rare plants.—*Phaseolus* (*DREPANOSPRON*) *smilacifolius*, n. sp.—Stem scandent, strigose-pubescent, 5–12<sup>ft</sup> high, twining over bushes with the habit of *Apios*: leaflets large, 5–6<sup>cm</sup> long, 5<sup>cm</sup> broad, thin, glabrous above and below, in outline deltoid-hastate, usually more or less 3-lobed, the basal lobes rounded, the apical one acute; stipules and stipels linear, minute, persistent: flowers in loose elongated racemes; pedicels filiform, unibracteate at base, 1–1.5<sup>cm</sup> long: calyx campanulate, with five obscure very obtuse teeth: corolla pink or white, rather large, 1<sup>cm</sup> long: legume nearly straight, glabrate, much compressed, 4–6-seeded, 5–6<sup>cm</sup> long, 1<sup>cm</sup> broad.

The section *Drepanospron* of Bentham, or *Euphaseolus*, to which this species belongs, is distinguished from the *Strophostyles* group chiefly by the racemose or often paniculate, instead of capitate inflorescence. The other North American members of the section are *P. retusus* Benth. and *P. Wrightii* Gray, both from the southwest: *P. sinuatus* Nutt., a Florida species, and our common northern wild bean, *P. polystachyus* (L.) B. S. P. Of these *P. Wrightii* has leaflets very deeply and very variously lobed, while the other species have rhombic-ovate nearly entire leaflets; our plant is remarkable both for the similarity of its leaves to those of *Smilax Bona-Nox*, and for their thin texture; the legume, moreover, is very nearly straight, and not falcate as in other members of the group. It was found in abundance by Mr. George V. Nash on hammock land near Lake City, Florida, August 31, 1895 (type no. 2505 in U. S. National Herbarium.)

*PHACELIA COVILLEI* S. Watson in Gray Man. 360. 1891. [Ed. 6.]—This interesting little *Phacelia* was collected originally May 5, 1889, by Mr. Frederick V. Coville on Larkspur island in the Potomac, about five miles above Washington, D. C. The plants were sent to Dr. Watson for determination, and were finally identified and described by him as a new species.

Larkspur island is the third in the series of islands above Little Falls. It is lower than most of the others, and was apparently inundated by the floods resulting from the heavy rains of the ensuing season. At all events, no trace of the plant could be discovered, either in the original locality or on any adjacent island until last April, when it was found most unexpectedly by Mr. Coville, Mr. Hicks, and others, including the writer, at several points along the river bank above Glen Echo, Maryland, very nearly opposite its original station.

In every case it grew in moist alluvial soil and was unaccompanied by either *Ellisia nyctelea* or *Phacelia parviflora*, between which *P. Covillei* has been supposed by some to be a hybrid. It is apparently the only eastern *Phacelia* with a campanulate corolla; and this circumstance, together with the fact that it has the aspect of *Ellisia* and the capsule of *Phacelia*, no doubt suggested the theory of possible hybridization.

PERILLA FRUTESCENS (L.) Britton, Mem. Torr. Club 5: 277. 1894.

*Ocimum frutescens* L., Sp. Pl. 597. 1753.

*Perilla ocimoides* L., Gen. Pl. Ed. 6, Add. 578. 1764.

This Asiatic mint is reported in the last edition of Gray's Manual on the authority of Schneck, as growing about dwellings and roadsides in southern Illinois. It had been collected by Professor Lester F. Ward at Crystal Spring in the District of Columbia, and is included in the "Catalogue of the Plants of the District"<sup>2</sup> though referred with hesitation to Bentham's variety *crispa*<sup>3</sup> which is a mere garden form. Additional specimens have been examined in the Herbarium of Columbia College collected at scattered points in New York, New Jersey, Pennsylvania, West Virginia, Georgia and Missouri. On October 28, 1895, Mr. L. H. Dewey and the writer came most unexpectedly on the plant growing in a large patch on the border of some woods near Waterloo Station, Alexandria Co., Va. It was then in good fruiting condition and easily identifiable.

CASSIA MULTIPINNATA NASHII Pollard, Bull. Torr. Club. 22: 515, 1895.—Since the publication of some notes on Florida cassias, specimens have been received from Miss Josephine Skehan, collected the past summer at Ocean Springs, Mississippi, which are undoubtedly referable to the above variety, having all the characters of *C. multipinnata*, but being of low, diffuse habit. The plant may very probably occur at different points along the Gulf coast, both in the typical and the varietal form<sup>4</sup>.

LIMNANTHEMUM NYMPHOIDES Hoffmg. & Link, Fl. Port. 1: 344. 1809.—This plant, together with *Trapa natans*, has become so thoroughly naturalized in ponds of the U. S. Fish Commission in Washington that it covers the surface of the water and has spread into several adjacent pools. In October a beautiful sight is presented by the multitude of yellow blossoms open in the sunlight.

<sup>1</sup>Gray, Man. 407. 1891. [Ed. 6.]

<sup>2</sup>Bull. U. S. Nat. Mus. 22: 104. 1881.

<sup>3</sup>DC. Prodr. 12: 164. 1848

<sup>4</sup>Since the above was written, Prof. S. M. Tracy, of the Mississippi Agricultural Experiment Station, has sent me a complete representation of the cassias growing in that state, from which it appears that both *C. multipinnata* in the typical form and *C. depressa* (loc. cit.) occur there.

RHAMNUS FRANGULA L., Sp. Pl. 193. 1753.—Mr. W. M. Van Sickle, of West New York, N. J., reports the discovery of additional specimens of this interesting European buckthorn in the swamp at Secaucus, some distance from the present known locality at New Durham. The problem concerning its mode of introduction into the United States is a difficult one to solve. The fact of Michaux's Arboretum having been situated on the site of the present New Durham swamp indicates that it may have been originally planted there, and thriving under favorable conditions, spread rapidly and in time developed trees of the size now found. It was long ago reported from Flushing, Long Island, but this station is now apparently obliterated.—CHARLES LOUIS POLLARD, *Washington, D. C.*

Pebble mimicry in Philippine island beans.—In looking over a keg of pebbles collected from the coast of Marinduque by Dr. Joseph B. Steere in his expedition of 1887-8, some beans were found which surprisingly resemble the water-worn pebbles with which they were associated. The mimicry is so perfect that almost every one is deceived until an opportunity for handling them is afforded, and even after being made aware of their nature mistakes will still occur. Inquiry developed the fact that these beans are produced by a coarse briar confined, as was expected, to the narrow strip of gravelly beach and met with here and there upon various members of this group of islands. Sending out trailing stems to a distance of twenty to thirty feet, carrying a leaf similar to that of the rose, they form a mat from three to four feet in height quite difficult to penetrate. Dr. Steere found the natives collecting them for shipment to Manila, to be used, as they said, in the manufacture of soap.

The beans, themselves, are sub-ellipsoidal in form, but show much irregularity in shape, apparently from mutual pressure in the pod. Indeed, here is one of the striking points of the mimicry, some perfectly resembling well rounded beach pebbles, while others mimic pebbles which have been broken across and then had their sharp edges rounded by continued friction. A handful of the beans shows as much and the same character of variation as is seen in the same number of quartz pebbles. The size is as variable as the shape, the three dimensions ranging in different specimens studied from 10 to 23<sup>mm</sup>; in a typical specimen being about 17×18×14<sup>mm</sup>. The color varies from moderately dark to light drab, some giving a faint greenish tinge, while the luster of many is exactly that of chert pebbles. In others of lighter color the effect is similar to that obtained from pebbles of chalcedony or of crystallized quartz. Nearly all the specimens show a series of approximately parallel darker