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George Dickie

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a study of pollen must be familiar with the fact that the emission of tubes by pollen-grains while still within the anther is by no means an uncommon occurrence. Robert Brown and Baillon have indeed observed them to attain a considerable length. But this offers scarcely any explanation of the extraordinary fact that in these closed flowers the pollen-tubes will reach the stigmatic surface or cavity after travelling for a considerable distance through the air in a straight line from the anthers, vertically upwards in the case of *Oxalis*, horizontally in others; while in *Viola canina*, according to Von Mohl's description, they creep for a distance along the surface and over the back of the ovary. None are seen wandering aimlessly about in uncertainty; they all seem guided by some unseen agency in the required direction; and yet an experiment of Darwin's ('Forms of Flowers,' p. 337) sufficiently shows that when not in proximity to the stigma, pollen-grains protrude their tubes in all possible directions. I may add that I have never seen myself, nor do I find it stated in any trustworthy description, that the pollen-tubes ever actually perforate the wall of the anther in order to reach the stigma in cleistogamic flowers, as is stated to be the case in *Juncus bufonius**; they always make their way either through terminal pores, or, as Von Mohl describes it, through the sutures of the anther. It seems hardly possible to attribute to heredity only such an apparently spontaneous tendency. If pollen-grains are able through many generations to acquire such a power as this, all need for an exciting stigmatic surface, and even for the carriage of pollen to the stigma, would seem to be obviated. The subject certainly deserves much closer and fuller investigation than it has yet received.

Note.—Since the above paper was written, two papers have been published containing drawings of cleistogamic flowers, both by the Rev. G. Henslow. In the 'Transactions of the Linnean Society,' Botany, 2nd series, vol. i. p. 317, are drawings of the closed self-fertilized flowers of *Viola odorata* and *V. canina*, *Oxalis Acetosella*, *Lamium amplexicaule*, *Epiphegus virginiana*, and *Hordeum murinum*; and in the 'Popular Science Review' for Jan. 1879, of most of the same species, as well as many others. Both are accompanied by excellent descriptions.

* See Batalin in 'Botanische Zeitung,' 1871, vol. xxix. p. 388.

Notes on Algæ from Lake Nyassa, E. Africa.
By GEORGE DICKIE, M.D., F.L.S.

[Read November 21, 1878.]

I AM indebted to Dr. Laws, of the Livingstonia Mission, Lake Nyassa, for the materials which yielded the organisms recorded here. Nearly all were attached to aquatic Phanogams; and a list of these may not be out of place, for which I owe to Professor Oliver assistance in naming them; most were imperfect, and therefore the genus only is stated in most cases. They are as follows:—*Vallisneria spiralis*, *Ceratophyllum* sp., *Potamogeton* sp., *Myriophyllum* sp., *Urticularia* sp., *Lagrosiphon muscoides*?, *Trapa bispinosa*?, and one of the Marsiliaceæ, viz. *Azolla pinnata*.

The list of Algæ is doubtless very meagre, with exception of the Diatoms; still, as the locality is of some interest, I have thought the species worthy of record in the meantime. I have to acknowledge assistance from the Rev. G. Davidson in compiling the list of Diatoms.

CONFERTA —? A few fragments only; the joints six times longer than broad, the diameter = .001; colour pale green.

BULBOCHETE PARVULA, *Kütz.* There is no doubt about the genus; nearest to the species stated, if not identical.

SPIROGYRA PALLIDA, n. sp.? Pallide flavo-virescens, minus lubrica, articulis cylindricis, diametro (= .00125) 4plo longioribus, fructiferis?; fasciis spiralibus 3, angustis, nodulosis; zygosporis? Cytioderma cellulæ, utroque fine nec protensum nec replicatum.

From an island in Livingstonia Bay, Lake Nyassa.

COSMARIUM MARGARITIFERUM, *Turp.* The examples seemed quite identical with the European species.

OSCILLARIA —? Trichomatibus strictis, distincte articulatis, articulis diametro (.00095) æqualibus; cytoplasmate pallide olivaceo.

LYNGBYA MARTENSIANA, *Menegh.*? The plant was attached to *Potamogeton*, and seems identical with, or nearly allied to, the species described by Meneghini, and found in thermal waters near Verona, also at Baden-Baden, and reported by Mertens as found at St. Helena.

CYLINDROSPERMUM NYASSÆ, n. sp. Trichomatibus rectis, in stratum cæruleum intricatis, articulis ellipticis, diametro (·00005) duplo longioribus; sporis?

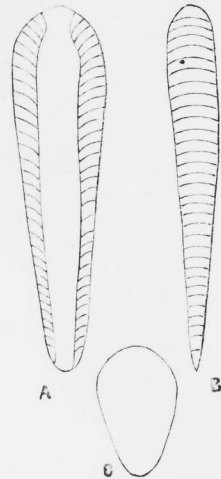
It communicates to water a blue solution with dull-red fluorescence.

DIATOMACEÆ.

- Cyclotella rotula, *Ktz.*
- C. operculata, *Ktz.*
- Epithemia ventricosa, *Ktz.*
- E. zebra, *Ehb.*
- Epithemia alpestris, *Sm.*
- E. sores, *Ktz.*
- E. turgida, *Ktz.*

• EPISTEMIA CLAVATA, n. sp. Medioeris, plus minusve clavata, apicibus rotundato-obtusis, costis validis subparallelis, 15 in ·001; latere superiore (dorso) convexo, inferiore subrecto. Long. = ·001-·007 poll.

More or less plentiful on most of the Phænogams already noted, but especially so on the *Spirogyra*. The clavate form at once distinguishes it from any known species; at first sight it has a resemblance to *Suriella* (see woodcut). The striæ proper are not represented here; they are 30 in ·001.



Epithemia clavata: A. frontal. B. lateral view; C. small frustule in outline; all greatly magnified.

- Eunotia tridentata, *Ehb.*
- Himantidium pectinale, *Ktz.*
- Cocconema cymbiforme, *Ehb.*
- C. cistula, *Hemp.*
- Amphora ovalis, *Ktz.*
- Eacyonema prostratum, *Berk.*
- Cocconcis placentula, *Ehb.*
- Fragilaria undata, *Sm.*
- Synedra ulna, *Ehb.*
- S. acus, *Ktz.*
- S. biceps, *Ktz.*
- Navicula acrosphaeria, *Rabh.*, var. sandvicensis, *Schmidt.*
- Navicula gibberula, *Sm.*
- N. gastrum, *Ehb.*
- N. elliptica, *Ktz.*
- N. rhomboides, *Ehb.*
- N. gracillima, *Pritch.*
- Stauroneis phœnicenteron, *Ehb.*
- Diademesis confervacea, *Ktz.*
- Gomphonema dichotomum, *Ktz.*
- G. intricatum, *Ktz.*
- G. naviculoides, *Sm.*
- G. turris, *Ehb.*

It will be observed that all the genera of Alge enumerated here are well-known European &c. forms. Nearly all the species of Diatomaceæ are also very widely diffused elsewhere; the exceptions are few, *Diademesis* for instance, hitherto confined to the West Indies. The only peculiar form is the new *Epithemia*.

On the Symplocaceæ. By JOHN MIERS, F.R.S., F.L.S., &c.,
Dignit. et Commend. Ord. Imp. Bras.

[Read November 21, 1878.]

It is now 40 years ago, after a careful examination of the plants of the two families, that I became convinced that the groups of the *Styracææ* and *Symplocacææ* should be separated into two natural Orders; but it was not till 1851 that I gave publicity to this opinion¹, which I then supported under strong evidence. G. Don, it is true, first suggested this separation in 1837²; but the order which he then established consisted only of the genus *Symplocos*, which he divided into sections: (1) *Alstonia*, (2) *Lhodra*, (3) *Palura*—a very incomplete arrangement.

It is to Mr. Bentham that our best thanks are due for first elaborating the characters of true *Symplocos* in 1841³, a contribution rendered more valuable by an excellent analytical drawing. Besides this, he did much in that estimable memoir to explain the structures of *Alstonia*, *Hopca*, *Ciponima*, and *Lhodra*, thus laying the foundation of our real knowledge of the family. Following in the footsteps thus well marked out in this early stage of the inquiry, I have elaborated the present memoir under a long promise to that effect.

As a preliminary, it was necessary to adduce undeniable evidence in support of the *Symplocacææ* as a natural order distinct from the *Styracææ*. In addition to the facts already quoted from my contributions, I may refer to the summary offered in Lindley's 'Veget. Kingdom'⁴ and to another of my own showing⁵.

¹ Contrib. Bot. i. p. 22; Ann. Nat. Hist. 2nd ser. viii. p. 162 (Sept. 1851).

² Dict. iv. p. 1.

³ Linn. Trans. vol. xviii. p. 231, tab. 18.

⁴ Page 563a (1853), with comparative analytical figures of the structures of *Symplocos* and *Strigilla*, adding the differential characters of the two groups.

⁵ Contrib. Bot. i. p. 159; Ann. Nat. Hist. 3rd ser. vol. iii. p. 129, Feb. 1859.