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BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

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# THE JOURNAL OF BOTANY

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JAMES BRITTEN, K.S.G., F.L.S.

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THE JOURNAL OF BOTANY was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

Without professing to occupy the vast field of general Botany, the Journal has from its inception filled a position which, even now, is covered by no other periodical. It affords a ready and prompt medium for the publication of new discoveries, and appears regularly and punctually on the 1st of each month. While more especially concerned with systematic botany, observations of every kind are welcomed. Especial prominence has from the first been given to British botany, and it may safely be said that nothing of primary importance bearing upon this subject has remained unnoticed.

Bibliographical matters have also received and continue to receive considerable attention, and the history of many obscure publications has been elucidated. Every number contains reviews of new and important books written by competent critics: in this as in every other respect a strictly independent attitude has been maintained. While in no way officially connected with the Department of Botany of the British Museum, the Journal has from the first been controlled by those whose acquaintance with the National Herbarium has enabled them to utilize its pages for recording facts of interest and importance regarding the priceless botanical collections which the Museum contains. In 1896 it became necessary to increase the size of the Journal, owing to the number of papers sent for publication: the number of plates was at the same time augmented.

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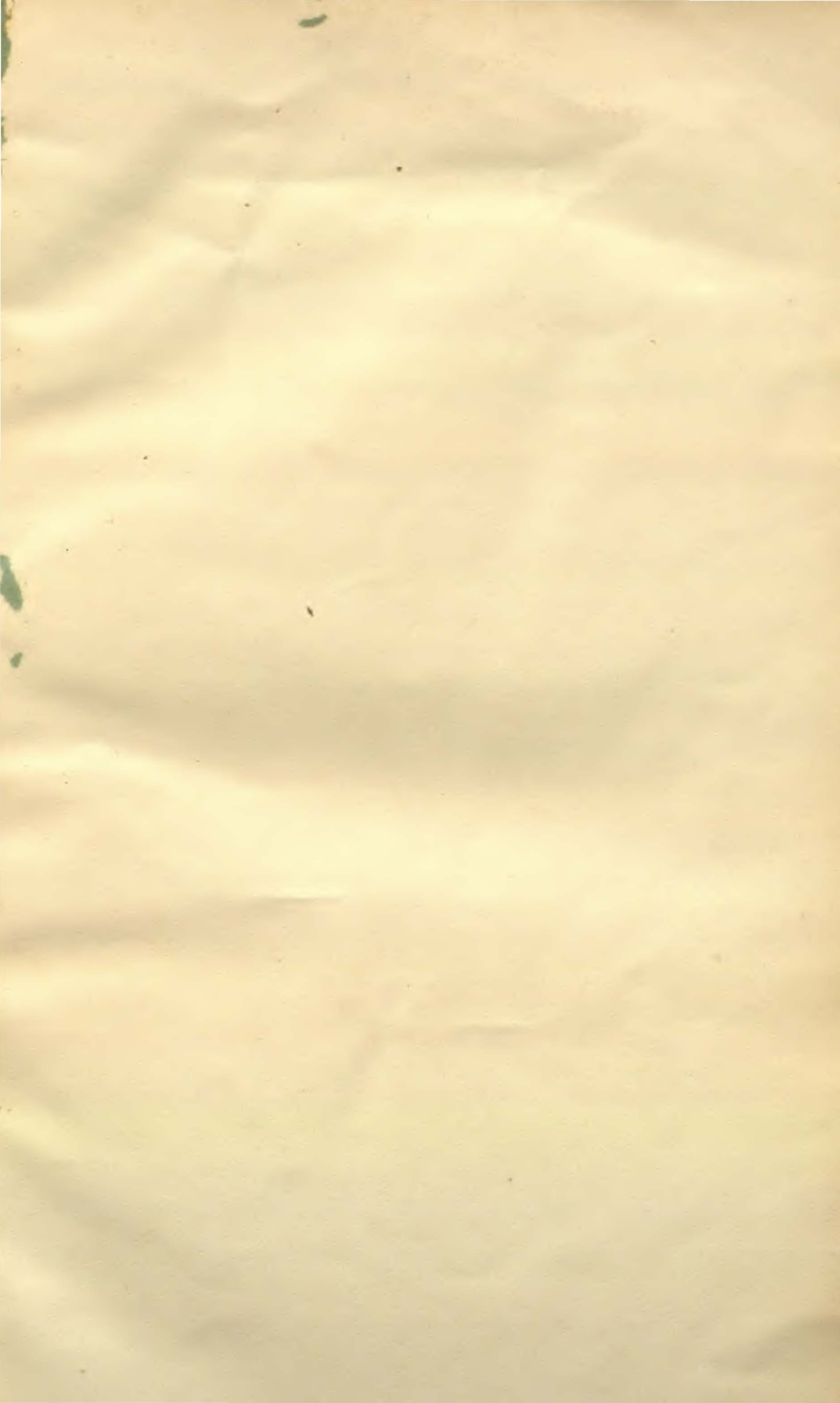
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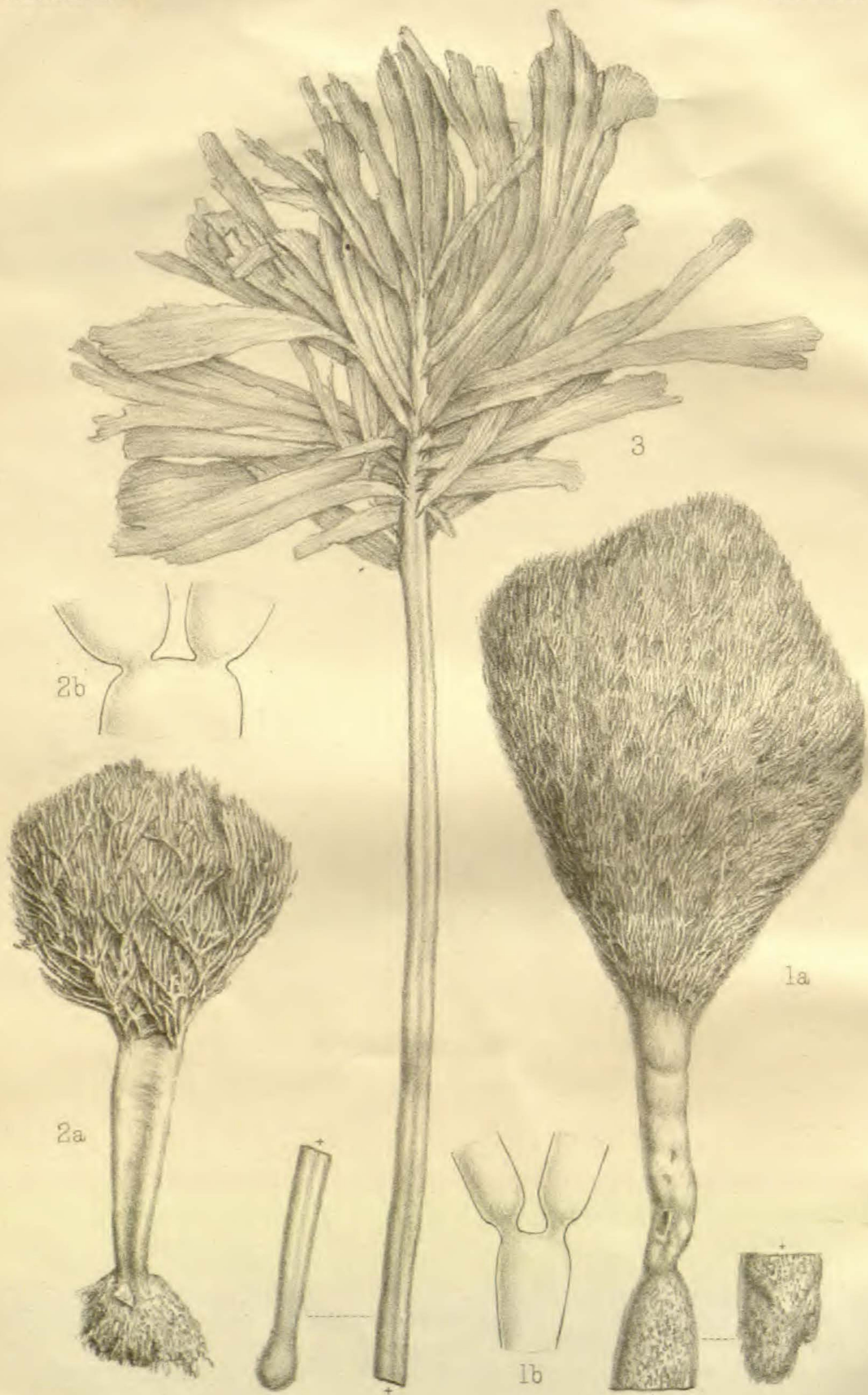
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Penicillus and Rhipocephalus.

THE  
JOURNAL OF BOTANY  
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NOTES ON PENICILLUS AND RHIPOCEPHALUS.

BY A. AND E. S. GEPP.

(PLATE 468.)

*Penicillus* is one of the genera of calcified algæ which were formerly regarded as zoophytes under the name of *Corallina*. It received the name *Penicillus* from Lamarck in 1813. Though dubbed *Nesæa* by Lamouroux in the preceding year, it had no right to that name; for *Nesæa* was already, and still is, in use for a genus of *Lytharicieæ*. Decaisne in 1842 made the first satisfactory attempt to put the genus into systematic order, but retained in it the two species which Kützing in 1843 separated off under the name *Rhipocephalus*.

The West Indian region is the headquarters for most of the species, and parts of it have recently been carefully explored by Mr. Marshall A. Howe, who has published a short report (in Journ. New York Bot. Garden, v. 1904, pp. 164-166) of his visit to the South of Florida and the Bahamas, in which he says that *Penicillus* and *Rhipocephalus* are especially well represented in the Bahama Islands. He has been so kind as to supply us with a set of specimens gathered by him. These comprised four forms of *Penicillus*—viz. the well-known *P. capitatus* and *P. dumetosus*, with a new species and a new variety. These latter he allows us to describe, as we are working at a revision of the genus. The diagnosis of the new species is as follows:—

**P. pyriformis**, sp. n. (fig. 1). Stipite brevi (10-30 mm.), crasso (6-7 mm.), parum compresso, in capitulum vix penetrante, superficie inæquali; capitulo pyriformi, 5-7 cm. longo, 3-4.5 cm. lato, denso, post exsiccationem glaucoviridi; filamentis capituli calce indutis, ascendentibus, congestis, intertextis, 150-200  $\mu$  crassis.

*Hab.* Bahama Islands, Bemini Harbor, in 1-8 dm. of water, low tide, with *P. capitatus*, *Rhipocephalus Phœnix*, &c., April, 1904, M. A. Howe! (No. 3236), in Herb. Mus. Brit. Bermuda, Eli's Harbor, Somerset, M. A. Howe! (No. 244). Florida, Key West, Hooper! in Farlow Anderson & Eaton's Alg. Exsicc. Amer. Bor. No. 43 pro parte, in Mus. Bot. Copenhagen.

It differs from *P. capitatus*, as was pointed out to us by Mr. Howe, by the usually pear-shaped capitulum, the interlacing filaments, and the stalk barely penetrating into the head. It is, moreover, a heavier plant, owing to the amount of sand entangled among the filaments of the capitulum. The stalk may be sometimes a little branched, and the capitulum infundibuliform; the filaments are sometimes globosely constricted above or below the dichotomy.

Mr. Howe's other novelty is in our opinion no more than a slender variety of a little-known existing species—*P. Lamourouxii* Decaisne. The type of this species came from the Bahamas, and is preserved in Herb. Lamouroux at Caen under the name *Nesea dumetosa*. Since Decaisne published his description of it in 1842 (*Ann. Sci. Nat.* 2<sup>de</sup> Sér. tom. xviii. p. 109), no one has added fresh records of the true plant. Kützing's figure of "*Lamourouxii*" (*Tab. Phyc.* viii. t. 29, fig. 1) represents a plant of *P. dumetosus*; on the other hand, Crouan's specimens of "*Lamourouxii*" issued by Mazé et Schramm in their *Algues de la Guadeloupe*, Nos. 488 and 779 are *P. capitatus*. The typical form of the species is undoubtedly rare. In the several collections which we have examined we have found only three gatherings—viz. in Herb. Lamouroux, Herb. Chauvin, and Herb. F. S. Collins, in which last there is a single crushed specimen under the name *P. dumetosus* from Annato Bay, Jamaica, collected by Mrs. Pease and Miss Butler. In Herb. Lamouroux there are some nine specimens of *P. Lamourouxii* from the Bahamas; and in Herb. Chauvin there are six, unlocalized, but probably from the same locality, Chauvin having been the friend and successor of Lamouroux. And here we would take the opportunity of expressing our warm thanks to Prof. Lignier, the present distinguished occupant of Lamouroux's chair, for his kind courtesy in lending us the valuable collections of Lamouroux and Chauvin for examination.

Our new variety is more commonly distributed than the type, and has been issued in some published sets as *P. capitatus*. Its diagnosis is as follows:—

*P. Lamourouxii* Decaisne, var. GRACILIS, var. nov. (fig. 2). Stipite 30–40 mm. longo, c. 5 mm. crasso, sæpius compresso, rare subcanaliculato, leptodermo (hinc molli), lævi, vix in capitulum penetrante; capitulo globoso, 30–40 mm. diam.; filamentis capituli duplo magis copiosis quam in planta typica et gracilioribus (300–400  $\mu$  crassis), ascenduntibus, calce valde indutis.

*Hab.* Florida, Key West, in 3–10 dm. of water at low tide, *M. A. Howe!* (No. 1412*b*). Bahamas, Bemini Harbor, *M. A. Howe!* (No. 3238). St. Croix, *Herb. Börgesen!*

This variety is an intermediate between *P. Lamourouxii* and *P. capitatus*. In habit it closely resembles the former, as also in its thin-walled, compressible, usually flattened stem, which penetrates but a very short way into the capitulum (less than a quarter of the length of the capitulum). It differs from typical *P. Lamourouxii* in having more abundant and more slender capitulum-filaments, those of *P. Lamourouxii* being 400–500  $\mu$  in diam., while those of var. *gracilis* measure 300–400  $\mu$ .

*P. capitatus* differs in having still more slender filaments, normally measuring 100–200  $\mu$  in diam., and not exceeding 300  $\mu$ ; its stem, moreover, is thinner, terete, rigid, often much longer, and penetrates into the middle of the capitulum or beyond.

As regards figures 1*b* and 2*b*, which represent portions of capitulum-filaments branching dichotomously, each branch exhibiting the characteristic basal constriction, it should be pointed out that neither in *Penicillus* nor in *Rhipocephalus* is there ever at these constrictions or elsewhere any transverse septum. The plant is unicellular throughout. On this point Harvey was in error. In writing of *P. dumetosus* in *Nereis Boreali-Americana*, iii. (1857), p. 44, he says: "As long as these longitudinal filaments cohere into a stipe they are unicellular; but when they become free at the apex of the stipe, they are articulated, or pluricellular; and a capitulum of confervoid filaments completes the frond." A similar view of the question had been already promulgated by Montagne in 1845 (*Ann. Sci. Nat.* xviii. pp. 262–3); when he flatly denied the truth of Kützing's observation (*Ueber die "Polypiers calcifères" des Lamouroux*, 1841, p. 11) that the filaments of the capitulum are not septate. Yet Kützing was right, and Montagne wrong.

Passing now to the other genus—*Rhipocephalus*—we find in the British Museum Herbarium a remarkable and unique specimen (fig. 3). It was collected on the coast of Florida by Rugel, and was acquired by the Museum with Shuttleworth's herbarium. It might at first sight be regarded as a new species; but, after a careful study of numerous specimens of *R. Phœnix* in about half a dozen herbaria, we are convinced that Rugel's plant must be referred to this species, though much exceeding normal specimens in length of stem and flabella. *R. Phœnix* is a most variable species in shape and size. In normal specimens the terete calcified stem varies in length from 30 to 90 mm. The upper part (usually 20–40 mm.) is concealed by the capitulum, the component flabella of which are about 5–20 mm. long. The capitulum varies much in shape, being round, oblong, conical, or irregular. The flabella are usually ascending, and may be long or short. Each flabellum is a calcified, monostromatic, cuneate lamina, composed of a number of filaments closely coherent side by side, and arising from a single basal filament by repeated dichotomies. The diameter of the filaments is 75–100  $\mu$ .

The length of the flabella varies greatly in different plants, and produces marked differences of external appearance. It is possible to trace a series of forms passing from the type to two opposite extremes, in one of which the flabella are short (5–10 mm.), ascending, closely imbricated into a sort of cone of overlapping scales or collars; in the other extreme the flabella are long (upwards of 20 mm.), irregular, variously and deeply laciniate, never (except, perhaps, in youth) united into trim, perfoliate collars, but having a ragged unkempt appearance. To the former of these extremes we give the name *brevifolia*, and to the latter *longifolia*; but we are unable to regard them as more than mere forms grading insensibly into the type.

The type of *Rhipocephalus Phœnix* is no longer in existence, but there is a satisfactory figure of it in Ellis and Solander's *Natural History of Zoophytes* (1786), p. 126, tab. 25, fig. 2, under the name *Corallina Phœnix*. It has flabella of about 15 mm. long.

We think that there are three main forms of *R. Phœnix*, which should be defined as follows:—

1. Forma *typica*, flabellis c. 15 mm. longis, capitulum oblongum æqualem efformantibus.

*Hab.* Unknown.

2. Forma *brevifolia*, flabellis 5–10 mm. longis, sæpius in verticillos ascendentes vaginantes dense imbricatos lateraliter conjunctis, comam comptam sæpe elongato-conicam efformantibus; stipite usque ad apicem capituli percurrente.

*Hab.* Bahamas, Bemini Harbor, in 1–6 dm. of water at low tide, *M. A. Howe!* (No. 3239). Guadeloupe, *Mazé!* (No. 24, 1<sup>re</sup> Série) in Herb. Brit. Mus.

3. Forma *longifolia*, flabellis 20 mm. et ultra longis, irregularibus, profunde et irregulariter laciniatis, ascendentibus vel divergentibus, comam horridulam efformantibus.

*Hab.* Florida, Key West, on sandy bottom in 6 dm. of water at low tide, *M. A. Howe!* (No. 1612). Florida, *Rugel!*

Rugel's plant, of which we give a figure (fig. 3), differs strikingly from normal specimens, as we said above, in the great length of its stem (150 mm.) and of its flabella (48 mm.). Yet, though twice as long as any other specimens that we have seen, it is nothing but a giant example of our form *longifolia*, differing in no respect (apart from size) from ordinary specimens; for instance, the flabella have the normal characteristic structure of *R. Phœnix*, being composed of laterally coherent filaments which have a diameter of 75–100  $\mu$ . Though the flabella exhibit an unusual degree of spreading, this is largely due to their accidental displacement during drying, and is not natural; for the effect of gravitation upon the flabella when submerged would be very slight, and would be more than counteracted by the buoyancy derived from the clinging or imprisoned bubbles of oxygen gas evolved by the plant during the process of photosynthesis under a tropical sun. During life the flabella were probably suberect. From prolonged apical growth the stem attained its remarkable length; year by year it produced gradually longer and longer flabella at its apex, the older and shorter ones falling off below. In this respect it is the antithesis of the form *brevifolia* in which the flabella never exceed a length of 10 mm., though the stem may grow up to a length of 80–90 mm.

In conclusion, we should like to thank Mr. M. A. Howe for placing at our disposal such excellent material, and for the benefit of his observations and experience. We have also to thank him for putting before us some fine and recently gathered specimens of the rare and almost unknown *Rhipocephalus oblongus*, an account of which will be published later on.



## EXPLANATION OF PLATE 468.

1. *Penicillus pyriformis* sp. n. — *a.* Plant from Bahamas (*M. A. Howe*, No. 3236), natural size. *b.* Dichotomy of branch, showing absence of septa at constrictions,  $\times 40$ .

2. *P. Lamourouxii* Dec. var. *gracilis*, var. n. — *a.* Plant from Key West (*M. A. Howe*, No. 1412 *b*), natural size. *b.* Dichotomy of branch, showing that the constrictions are not septate.

3. *Rhipocephalus Phoenix* Kuetz. forma *longifolia*, f. n. — Plant from Florida (*Rugel*), natural size.

## NOTES ON LIMONIUM.

BY C. E. SALMON, F.L.S.

## III.—LIMONIUM VULGARE Mill.\*

LINNÆUS (*Sp. Pl. edit. i.* 1753, 274) gave only the following short diagnosis of this plant:—" *S. Limonium. Statice caule nudo paniculato tereti, foliis lævibus.*" Under this were probably included both *L. vulgare* Mill. and *L. humile* Mill. (*S. bahusiensis* Fr.); in fact, the specimen in Linnæus's herbarium labelled, "2. *Limonium*" in his own handwriting, is undoubtedly the latter species.

Miller, in his *Gardeners Dictionary* (ed. viii. n. 1, 1768), gave the following description of *Limonium vulgare*:—" *Foliis ovato-lanceolatis, caule tereti nudo paniculato.* Sea Lavender with oval spear-shaped leaves and a taper paniculated stalk. *Limonium maritimum majus.* C. B. P. 192. Common great Sea Lavender"; and stated that it grew in several parts of England in marshes "flowed by the sea." A specimen named by Miller is in *Herb. Brit. Mus.*

In 1832, E. Fries realizing that the name *S. Limonium* of Linn. *Fl. Suec.* (1755), ed. ii. n. 270, p. 99, covered two plants, separated them under the names *Statice Limonium Scanica* and *S. Limonium Bahusiensis*, giving an accurate account of both, and contrasting them (*Nov. Fl. Suec. Mant. i.* 10).†

Six years later, Drejer (*Fl. Excurs. Hafn.* 121) gave a more detailed account of the two plants. Although quoting Fries's varietal names, but raising the plants to the rank of species, he called the plant under discussion *S. Behen* and the other *S. rariflora*: the latter he considered only differed from the *Bahusiensis* of Fries in its small size. I may mention here that Drejer quoted as synonyms Miller's names as adopted in this paper.

Fries later (*Summ. Veg. Scan. i.* 1846, 200) recognized the two as species; he allowed Drejer's name, *S. Behen*, to stand in place of his *scanica*, but reinstated *S. bahusiensis* with two segregates, *borealis* and *danica*—the latter to represent Drejer's *rariflora*. These forms will be dealt with later. We have thus, both from

\* See *Journ. Bot.* 1903, 65; 1904, 361.

† See Mr. Britten's note in this *Journal*, 1904, 353, where the date of Drejer's *S. Behen* should be 1838.