

out. Fig. 2 shows the lip of *S. praecox* (from Thomasville, Georgia) similarly treated: *both from material preserved in alcohol*.

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EXPLANATION OF PLATE 51.—*Spiranthes neglecta* to show inflorescence, leaves, and roots. (Natural size.) Fig. 1, petal ($\times 3$). Fig. 2, lateral sepal to show involute margin ($\times 3$). Fig. 3, flower ($\times 3$). Fig. 4, upper sepal ($\times 3$). Fig. 5, lip, flattened out to show outline ($\times 3$).

MISCELLANEOUS NOTES ON NEW ENGLAND FERNS,—VI.

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NOTE 10.—A NEW FORM OF *NEPHRODIUM SPINULOSUM*. Somewhat late in the summer of 1902 Mr. Henry A. Purdie brought to me an unusual form of *Nephrodium spinulosum*, Desv., which he had collected in Concord, Massachusetts. His specimen consisted of one large frond with narrowly angular aculeate segments resembling some forms of *Polystichum angulare*, the whole presenting an appearance quite unlike the ordinary forms of *N. spinulosum*.

Mr. Purdie reported finding only one plant, which he carefully located for further investigation, and in August, 1903, I had the pleasure of visiting the locality with him and was able to obtain a few additional fronds for specimens. I also secured, by detaching them from the main rootstock, two offshoots for propagation, and was able to separate these subsequently into two more, thus obtaining four small plants as a nucleus for further increase. The swamp in which the original plant was found abounds with *intermedium* and *dilatatum* forms of *N. spinulosum*, and characteristics of each of these are to be seen in the make-up of the new form. Indeed, it might be not inaptly described as a very much dissected var. *intermedium* with the outlines of var. *dilatatum*. In the vicinity of the plant there were a few large individuals of var. *intermedium* and from them the new fern was readily distinguishable by its unique architectural form, notwithstanding some resemblance to its nearest neighbor.

As to its probable origin two theories present themselves; for it may be either a hybrid or a spore variation. In this instance I am

not inclined to accept the hybrid theory because, although characteristics of var. *intermedium* and var. *dilatatum* may be found in its composition, these are not sufficiently obvious or pronounced to justify us in assuming the hybrid relationship of the new form. The special feature of Mr. Purdie's fern is the narrow and angular form of the segments, and in this respect there is a resemblance to some of the *angulare* forms of *Polystichum aculeatum*. In that species the segments are usually auricled at the base on the anterior side, and the auricle is essentially a characteristic of the genus; nevertheless the auricle is frequently wanting altogether, and in this way forms arise to which our fern bears a strong resemblance. In fact, if any form of *P. aculeatum* grew near by there might be grounds for assuming a hybrid relationship between it and the new form. Then, too, I believe with the distinguished and lamented botanist, Thomas Meehan, that the tendency to vary inherent in all plants is sufficient to account for most of these exceptional forms, and that it is rarely needful to resort to the theory of hybridity. It is noteworthy also that where hybridity has actually existed the resultant characters have been sufficiently evident even when actual proof was wanting; and the recent successful experiments of that very clever fern-student, Miss Margaret Slosson, in demonstrating hybridity in *Asplenium ebenoides* and *Nephrodium cristatum* \times *marginale*, show very conclusively that in such instances proof is attainable.

I am much more inclined to the belief that the Concord fern is a spore-variety. There is, in fact, no reason why the results of spore-reproduction in the fern-plants should not be as diverse as those of seed-reproduction in the flowering plants. I remember to have seen once in a florist's greenhouse six plants of a *Selaginella*, all raised from the spores of a single individual, which was still growing near by, yet they were so different that had their origin not been positively known they might have passed as different species. Therefore, I am inclined to consider this fern as having originated from a spore of either var. *intermedium* or var. *dilatatum*, and here in comparing the different characters, I find those which suggest var. *dilatatum*, to be of a superficial nature, such as the mere outlines of the lamina and the angles of direction of the different parts, while those which suggest var. *intermedium* are fundamentally associated with fructification and vestiture. I therefore regard the plant as a natural variation of *Nephrodium spinulosum*, var. *intermedium*, and

think it will be better treated as a variety than as a mere form, as the entire plant shows the peculiar character, which is again reproduced in its offspring. It has apparently been established for some years, having attained large proportions and, fortunately, there appears to be little or no danger of its being disturbed, as the surrounding woods are safe-guarded from trespass. The plant is certainly unique in every way and entitled to recognition. I therefore submit the following description:—

NEPHRODIUM SPINULOSUM, var. **Concordianum**, n. var. (PURDIE'S CONCORD NEPHRODIUM.) Original plant large, with matured fronds two and one-half to three feet in height. Rootstock as in the species; crosiers densely clothed with rich brown scales; stipites one-fourth to one-third the length of the whole frond, greenish-stramineous in the early stages but at length turning to a warm brownish tone, channeled along the face, rounded at the back; scales at base broadly ovate-acuminate, dark brown with deeper centres, the upper pale and intermixed with narrower linear scales and chaff; laminae one and one-half to two feet long, correspondingly broad, narrowing from below the middle upward to an acuminate apex, tripinnate throughout, the inferior pinnules on the lowermost pinnae of the larger fronds two inches long and pinnate with pinnatifid or deeply lobed oblique divisions; segments distinct, narrowly angular, about one-eighth of an inch wide, sharply aculeate, the base so narrow as to appear stalked (in some cases really so); rachises scaly throughout with small pale scales and chaff; venation pinnate; sori below the apex; indusia and surfaces minutely glandular.

Habitat: rich swampy woodland, Concord, Massachusetts, autumn of 1902, *H. A. Purdie & Wm. Brewster*; August, 1903, *H. A. Purdie & G. E. Davenport*.

As the discoverer of this interesting fern protested with his usual modesty against my associating his name with it, I have decided to dedicate it to Concord. Type specimens from the original plant will be deposited in the Gray Herbarium, the Herbarium of the New England Botanical Club, and the Davenport Herbarium (Massachusetts Horticultural Society).

MEDFORD, MASSACHUSETTS.



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