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THE BASIS OF NOMENCLATURE FOR ALGAE.

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Readers of the article "On the Vienna Rules of Botanical Nomenclature" in the March Rhodora will remember that Art. 9 reads "The rules and recommendations of botanical nomenclature apply to all classes of the plant kingdom, reserving special arrangements for fossil plants and non-vascular plants"; and that a footnote states that these special arrangements have been reserved for the Congress of 1910. The questions involved in regard to cryptogams are many and difficult to answer, and when we consider the long and careful work that was necessary to reach a conclusion in regard to the vascular plants, the time before the next Congress is none too long for their consideration. "Botanical nomenclature begins with the Species Plantarum of Linnaeus," says Art. 19; but if one considers the quite insignificant space given to the cellular cryptogams in this work, it might possibly be called a "point" for starting, certainly not a "base" for anything. The writer cannot claim any familiarity with the subject except as regards the algae, but would like to call attention to some features of their case.

While the number of known species of flowering plants has increased almost in geometrical ratio, the idea of a species, on the whole, remains about the same. Some species have been found to be aggregates; with rapidly increasing numbers of species more attention has to be given to smaller details, but in the great majority of cases the characters by which species are differentiated can be seen by the naked eye, or with a pocket lens. As regards algae, not one species in a hundred can be described so that it could be recognized without the use of the microscope, usually requiring quite high powers. Of course none of these

could have been recognized in Linnaeus's day, nor for a long time afterwards. The system of classification adopted by Linnaeus for flowering plants remained in general use until superseded by a natural system, which in its general outlines and often in considerable detail is accepted at present. But all through the nineteenth century system after system was proposed for the algae, each practically beginning anew, the position of genera changing with kaleidoscopic rapidity. It is sometimes really pathetic to see with what conscientious care a system was developed on what we now know to have been scanty material, imperfect data, and misinterpreted observations. Occasionally we find a piece of work in some limited field of which the records have been supplemented rather than superseded by later observations; thus the insight of Vaucher's Histoire des Conferves, that celebrated its centenary four years ago, is little short of marvellous, when we consider the scanty appliances then available; Nägeli's Gattungen einzelliger Algen of 1848 must be referred to to-day by everyone studying the unicellular algae; but Nägeli's system, like the systems of Kützing and the others, was hardly more permanent than last year's snows. Back of the time of C. Agardh, in the earlier part of the last century, practically no types are to be found; and though in the Agardh herbarium, continued by the son, J. G. Agardh, we have a most valuable collection of original specimens, we find in many cases that more than one species, as we now know them, was included under one name; it was impossible to distinguish them at that day, and of course the diagnosis, giving only the characters then discernible, gives us little help as to which species should bear the name. Evidently the basis that is suitable for the nomenclature of the *Rosaceae* is not suitable for the nomenclature of the *Chlorophyceae*.

But is it possible to fix any one satisfactory basis for algae in general? The more we look at it, the less likely it seems. The larger algae, those included in the genus *Fucus*, were fairly well known to the older authors, so that nearly all of the species in Turner's Icones Fucorum, 1808–1819, remain valid to-day; but this is by no means the case with the species of Dillwyn's British Confervae of 1809. To ignore Turner's species in the Icones would certainly be unwise; to identify species of *Microspora* or *Oedogonium* by Dillwyn would be very difficult. Though the idea of different starting points for different families of algae may seem at first undesirable, it may be the best solution of the problem; a definite proposition to that

effect, the first proposition of the kind as far as known to the writer, has been made by Prof. O. Nordstedt.[1] As Nordstedt is the highest authority on the desmids, was a member of the Congress of Vienna, and was appointed on the committee to take charge of the preliminary work on non-vascular plants for the Congress of 1910, his opinions should carry much weight. He considers in detail all the genera and many of the species of desmids, proposed in the first half of the last century, a chaotic assemblage. While some authors made contributions of merit, there is no one work that can be considered as at all complete to its time until we come to Ralfs, who in 1848 published The British Desmidieae; this work gives detailed descriptions and excellent figures of all the British forms, and has as an "Appendix," a list of all other known species, a large part of them also with figures and descriptions. With few exceptions all the literature of the desmids up to 1848 was gone over by Ralfs, and references noted; the few papers to which Ralfs does not refer have been analyzed by Nordstedt, and while they add a few synonyms to Ralfs's species very little other change would have been necessary had Ralfs used them. There are a few genera in Ralfs's work which might have to give place to older names if we could be certain where we are now doubtful, but as after careful study of the older authors the uncertainty remains and is likely to continue, Nordstedt considers that the wisest plan will be to adopt for the desmids the rule "The nomenclature begins with the British Desmidieae by Ralfs in 1848." As a second rule he provides that all names used by Ralfs in Brit. Desm. as of earlier authors, should be so quoted, but only as so attributed by Ralfs; for instance *Euastrum oblongum* Grev. sec. Ralfs, Brit. Desm.

That this plan will simplify the nomenclature of the desmids is unquestionable, and that it will cause any serious inconvenience is unlikely. That Ralfs's monograph contains a few genera no longer classed as desmids can occasion no trouble, nor the fact that some of his genera have since been divided; that is merely what has always happened with increasing knowledge and discoveries of new forms. While in some cases Ralfs may have been misled by a faulty or hazy description by some older author, the chance of our now correcting this error is too small to outweigh the real gain of accepting Ralfs's definite description and clear figure, and working from them.

[1] Algological Notes 1–4. 1. The starting point of the nomenclature of Desmids. Botaniska Notiser, 1906, p. 97.

At the close of his paper Nordstedt mentions three monographs which may be used for bases in their respective sections; for practical work all three are now the standards, but to those who are worshipers of priority in itself, rather than as far as it may be the most useful means to an end, it will be rather a shock to find that these monographs date from 1888, 1893 and 1900 respectively: Gomont, Monographie des Oscillariées, 1893, and Bornet et Flahault, Revision des Nostocacées hétérocystées contenues dans les principaux herbiers de France, 1886–1888, have brought order where disorder reigned before; but as Nordstedt himself notes, they seldom recognize any species of which the authors have not examined authentic specimens; following each genus is a list of species inquirendae. Hirn, Monographie und Iconographie der Oedogoniaceen, 1900, is a more complete work, covering practically all known species, with full illustrations. It should be added that in the case of the heterocysted nostocs, Bornet and Flahault have since 1888, as a consequence of the examination of original specimens before unseen, published a paper changing in some few instances the names used in the Revision. What the status of these later names would be in case of the Revision being accepted as the beginning of nomenclature might be an interesting question.

In conclusion; the fact that Nordstedt recommends Ralfs as the starting point for the nomenclature of desmids is in itself a strong argument in favor of the plan, and a careful reading of his paper will prove quite convincing, it would seem, to any one who had not in some way prejudged the matter. It is likely that in regard to the other groups Nordstedt's suggestions, which are put forward as propositions only and without evidence or argument, may meet with more opposition; if so, however, it is for their opponents to propose something better.

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