Sciences, Phila., March 7, 1903) in his interesting paper on 'The Development of *Gonionema*' first gives the authority of Agassiz approving the correction, but in view of the confusion that might arise I propose to retain the name *Gonionemus,* originally given the genus by Professor Agassiz, and would like to urge that future writers use this form.

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BOTANICAL NOTES.

MOSSES.

Dr. A. J. Grout has just published 'Mosses with Hand-Lens and Microscope, Part I.,' as a quarto pamphlet of 86 pages. This is a 'non-technical hand-book, of the more common mosses of northeastern United States,' and is the outgrowth of 'Mosses with a Hand-Lens,' published by the same author a few years ago.

After a brief introduction, chapters are given dealing with classification and nomenclature, collection and preservation, mounting and methods of manipulation. The life history and structure of the moss plant are then given in some detail. Since the peristome is of considerable importance in indicating the relationships of mosses, the discussion of its structure is given due prominence in this section. An illustrated glossary of bryological terms constitutes a valuable feature of the work.

After listing the more important works on mosses for American students, the author takes up the systematic study of the more common forms. The key to the families is followed by the treatment of the Sphagnaceæ, Andreaceæ, Georgiaceæ, Polytrichaceæ, Buxbaumiaceæ, Fissidentaceæ and Dicranaceæ in part, leaving the remainder of the twenty-seven families recognized for treatment in subsequent parts (four to five parts in all will be issued). The classification adopted does not deviate very much from that given in Dixon and Jameson's 'Hand-book of British Mosses.' In the matter of changes in nomenclature the author has been quite conservative.

The work is illustrated with a considerable number of figures in the text, besides ten full-page plates. The fact that the latter are reproductions from 'Recherches sur Les Mousses,' by Schimper, 'Bryologia Europea,' and Sullivant's 'Icones Muscorum' is sufficient guarantee for their excellence. The purpose of the work is best given in the words of the author: 'To give by drawings and descriptions the information necessary to enable any one interested to become acquainted with the more common mosses with the least possible outlay of time, patience and money,' but we doubt if the author's prediction, 'that it makes the mosses as easy to study as the flowering plants,' will ever be realized. The beginning student will find Dr. Grout's publication a very valuable aid, and by those who do not have the more exhaustive treatises at their command it will be especially prized.

MORPHOLOGY OF ANGIOSPERMS.

Students of morphology will welcome the appearance of 'Morphology of Angiosperms,' by Dr. J. M. Coulter and Dr. Chas. J. Chamberlain, from the press of D. Appleton & Co. It is worthy of note that this work is not issued as Part II. of the 'Morphology of Spermatophytes,' as was the intention when its companion volume dealing with the Gymnosperms was published in 1901. This may be taken as a protest against considering the Spermatophytes as a group coordinate with the Pteridophytes.

The present volume, to use the authors' words, "Has grown out of a course of lectures accompanied by laboratory work, given for several successive years, to classes of graduate students preparing for research. It seeks to organize the vast amount of scattered material so that it may be available in compact and related form." After a brief introduction the following sequence of chapters is taken up: The flower, the microsporangium, the megasporangium, the female gametophyte, the male gametophyte, fertilization, the endosperm, the embryo. The chapter on the microsporangium ends with the formation of the mother-cells, and with their division the history of the male gametophyte is entered.

This line of separation is supported by the arguments of Strasburger, but even Strasburger has been known to change his opinions. To begin the gametophyte with the germinating spore certainly gives us a much clearer conception of the alternation of generations.

The history of the megasporangium is likewise terminated by the formation of the mother-cells, for their division is a reduction division, which is used as the basis of separation of sporophyte and gametophyte.

In the history of the male gametophyte the view that the tube-cell is the antheridium wall that develops a tubular outgrowth, 'while the generative cell and its products is the spermatogenous part of the antheridium' is given the preference. A careful reading of the chapter on the female gametophyte shows that the germination of the megaspore and formation of the gametophyte is not such a uniform process as most of our standard texts describe. In dealing with fertilization, 'double fertilization' is given due prominence, and the authors object to the use of the term as they consider it far from established that a real fertilization takes place; hence they prefer to speak of it as 'triple fusion.' The disputed centrosome question is touched upon and the authors' views may perhaps be gained from the following quotation: 'To say that all the figures that have been drawn have been mere products of the imagination would be a radical statement and one doubtless very far from the truth.' In the discussion of the endosperm its morphological character is touched upon, and while its exact nature is not considered established, the view that it is 'belated vegetative tissue of the female gametophyte, stimulated in a general way to develop by the act of fertilization,' is held as the most probable, although the possibility that it is a second sporophyte is admitted. Parthenogenesis and polyembryony are treated in the chapter on the embryo, and recent investigations seem to indicate that both are much more common than was formerly supposed.

In connection with each chapter there is a bibliography of the most important literature. An idea of the number of original papers consulted may be gained from the literature cited in the chapter on the female gametophyte, which includes 122 separate articles. The masterly way in which the vast amount of chaotic material has been handled is a commendable feature of the work, and we are inclined to think that the authors of some of our standard texts might consult it with profit.

Several chapters are given on classification, and it is encouraging to note that the authors have not found it necessary to develop a classification of their own but have been contented to adopt the classification of Engler and Prantl as given in 'Die Naturlichen Pflanzenfamilien,' as 'the best expression of our present knowledge, as applied to the whole of the Angiosperms.' The fact that 'this has not been pressed to the dreary details of minor groups,' but that general principles have been emphasized, makes these chapters of special value to the morphologist.

Separate chapters are given to geographic distribution, fossil Angiosperms and phylogeny of Angiosperms. The work closes with two chapters on the comparative anatomy of Gymnosperms and Angiosperms contributed by Professor E. C. Jeffrey, of Harvard University. Only a brief outline of the subject is attempted and perhaps some students will feel that a more extended treatment would have been advisable.

The whole work is illustrated with something over a hundred figures taken in large part from the original articles cited. The book is an admirable presentation of the subject and should be in the hands of every working botanist.

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*INVESTIGATIONS IN PROGRESS AT THE UNIVERSITY OF CHICAGO.**

IN a former Convocation Statement I endeavored to point out in a general way that the officers of the University were engaged very directly and earnestly in the prosecution of special investigations. It was my purpose to show that a great share of the strength of the University was given to research and in-

* From the last quarterly statement of President Harper.