

BOTANICAL NOTES

A VERY ANCIENT SEED

WHAT is called "the most primitive seed that has yet come to light" is described by Professor F. W. Oliver in the *Annals of Botany* (Jan., 1909) under the title "On *Physostoma elegans*, an Archaic Type of Seed from the Palaeozoic Rocks." It was first discovered in 1875 by the late Professor Williamson in the Lower Coal Measures of Lancashire, England, who gave it the name used above. In size it is quite small, being from tip to tip only 5.5 to 6 millimeters long. Its integument is ribbed, and at the level of the top of the nucleus the ten ribs become so many separate arms which project beyond the nucellus for a considerable distance. Many pollen cells were found, and these have been sectioned and studied to such good purpose that what appear to be fossil sperms (spermatozoids) have been made out. These are flattened oval bodies occurring in pairs in each pollen cell. That we now calmly accept these results of Professor Oliver's study of these ancient seeds shows what tremendous progress has been made in our knowledge of the general cycad type of seed apparatus, and we even scarcely smile at the author's somewhat naïve statement that "no appendages or cilia have been detected in connection with these bodies" (*i. e.*, the sperms)! The plants that bore these interesting seeds have not yet been traced, but the author refers them provisionally to the Lyginodendreae of the Pteridospermeae (Cycadofilices), and they are without doubt among the earliest of seed-producing plants.

CYTOLOGICAL PAPERS

WE can do little more than to enumerate the titles of the cytological papers that lie before us, beginning with "The Stature and Chromosomes of *Oenothera gigas*" (*Archiv für Zellforschung*, Bd. 3, 1909) by R. R. Gates, reaching among others the conclusion that closely related species of plants may differ in the number of chromosomes.—In a concisely written paper, "Cytological Studies on *Oenothera*" (*Ann. Bot.*, Oct., 1909) Dr. B. M. Davis adds many details, by the critical

study of the pollen development of *Oenothera grandiflora*.—Other mainly or wholly cytological papers by the same author are "Polar Organization of Plant Cells," "Some Recent Researches on the Cilia-forming Organ of Plant Cells," "Apogamy in the Ferns," "The Origin of Archegoniates," "The Permanence of Chromosomes in Plant Cells," all of which appeared in the *American Naturalist* during the past year or two.—Edith Hyde contributes her mite to the cytological treasury in a paper on "The Reduction Division in the Anthers of *Hyacinthus orientalis*," in the *Ohio Naturalist* for June, 1909.—"The Embryo Sac of *Habenaria*" (*Bot. Gaz.*, Oct., 1909) has been carefully studied by W. H. Brown, adding to our knowledge of the embryo sac and the early stages of the embryo.—Professor Schaffner contributes a valuable paper on "The Reduction Division in the Microsporocytes of *Agave virginica*" (*Bot. Gaz.*, March, 1909) bringing out the successive steps in the process.—Dr. A. A. Lawson's paper on "The Gametophytes and Embryo of *Pseudotsuga douglasii*" (*Ann. Bot.*, April, 1909) leads him to the conclusion that "this genus is not closely related to *Tsuga*," and that "the view that the Abietineae are the most ancient group of the Coniferales is very much strengthened."—A careful cytological study of the "Microsporophylls of *Ginkgo*" (*Bot. Gaz.*, Jan., 1910) by Anna M. Starr shows that the microsporophylls are in strobili that develop acropetally, with suggestions that they may have come "from a peltate type like the microsporophylls of *Taxus*."

SUMMER LABORATORIES

It is not too early for botanists to be planning for their summer outing and study, and so a notice of the prospectuses of waterside and mountain laboratories at this time is not out of place.

The Marine Biological Laboratory at Woods Hole, Mass., offers again courses in Plant Structures and Responses, Morphology and Taxonomy of the Fungi (by Dr. Duggar), besides the usual facilities for research work. It opens June 29 and closes August 9. Dr.

George T. Moore, of the Missouri Botanical Gardens, St. Louis, Mo., is in charge of this work.

The Biological Laboratory at Cold Spring Harbor, Long Island, announces courses from July 6 to August 16, in Cryptogamic Botany, and Ecology, as well as opportunities for investigation. Professor D. S. Johnson, of the Johns Hopkins University, is in charge of the botanical work.

In the interior we have it announced that the second session of the Lakeside Laboratory at Lake Okoboji, Iowa, will extend from June 20 to August 15. Professor T. H. Macbride, Iowa City, Iowa, will be in general charge of the botanical work. Courses are offered in Mycology, the Biology of Aquatic Plants, the Nature of Plants, Histological Methods and Ecology, with opportunities for research work.

In the Rocky Mountains there will be continued from the middle of June to the end of July the University of Colorado Mountain Laboratory at Tolland, Colo., at an altitude of nearly nine thousand feet. Alpine problems will be given especial emphasis. The botanical work is in charge of Professor Francis Ramaley, Boulder, Colo.

PAPERS ON ALGAE

A VERY helpful paper entitled "Hints on Collecting and Growing Algae for Class Purposes," by Professor J. A. Nieuwland, appeared in the October (1909) *Midland Naturalist*, in which the author gives with considerable fulness his methods which he has found to be successful. He encourages us by saying that "as a matter of fact it is not especially difficult to obtain or even to grow the lower plants, and most of them once gotten are easier to keep a long time than the phanerogams." It will repay careful reading by every botanist who has before him the problem of obtaining and maintaining a supply of fresh material of the algae.

The same author in the same number of the journal mentioned ventures a new interpretation of the "knee joints" often observed in *Mougeotia*, namely, that these bendings are

the first stages of the fragmentation of the filament, such fragmentation resulting in the formation of as many new filaments.

Ernst Hayren's paper on the "Algae of the Region of Bjorneberg" (in *Proc. Soc. Fauna et Flora Fennica*) is interesting because of the ecological notes that he manages to introduce. He includes observations on Chlorophyceae, Characeae, Phaeophyceae and Rhodophyceae.

"The Life History of *Griffithsia bornetiana*" is worked out in a paper in the October (1909) *Annals of Botany*, by I. F. Lewis. It is more than a report upon the structures which he found in his studies, for he has made it contribute to the discussion of the nature of alternation of generations. The conclusion is reached that in these algae "there is an antithetic alternation of generations, the gametophyte being represented by the sexual plants, the sporophyte by the sporogenous cells of the cystocarp." Five double-page plates beautifully illustrate the paper.

The unicellular fresh-water algae of the Dutch East Indies are described and figured in a recent paper by Dr. Ch. Bernard, and issued as Bulletin XXIV., of the Department of Agriculture at Buitenzorg. Our first remark is upon the significant fact of its issuance by a department of agriculture. Evidently the Netherlandish agriculturists take a very liberal view as to the matter for their bulletins. The desmids and many Protococcoideae are taken up in the paper, which is accompanied by six good plates.

Part I. of "The Marine Algae of Denmark," by L. K. Rosenvinge, has appeared as one of the memoirs of the Royal Academy of Sciences and Letters of Denmark. This part includes the introduction of about fifty pages, and about a hundred pages of descriptive text of Bangiales and Nemalionales. This text is well illustrated by text figures. Several maps and plates also accompany the present part. The work as a whole promises to be of great importance.

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