on the part of botanists to place plant classification on a broad phylogenetic basis. When a biology teacher attempts to place before his students, on a comparable basis, pictures of the plant and animal kingdoms and their subdivisions, he finds that zoologists have proceeded much further in dividing the animal kingdom into well-demarked, commonly accepted groups than have the botanists. First of all, he runs across the difference in terminology; the plant kingdom is divided into "divisions"; the animal kingdom into "phyla." "Division" is, of course, orthodox botanical usage, written down in the code of the Fifth International Botanical Congress of 1930, and followed practically exclusively in botanical writings, except by those rare plant biologists, like C. E. Bessey and J. H. Schaffner, who have been interested in delimiting the "phyla" of the plant kingdom.

While, scientifically, this difference in terminology may be considered trivial, the question is raised here whether there may not also be an unsuspected biological significance as well. Is it not a fact that the word "phylum" is much more appropriately applied to the subdivisions of the animal kingdom? That zoologists have really succeeded in recognizing and defining genetically determined phyletic groups, while botanists have been satisfied to go along with such catch-all congeries as "Thallophytes," a group which may be compared in content to the whole animal subkingdom of invertebrates?

That botanists have been slower in analyzing the plant kingdom into natural, more or less coordinate "phyla" has several possible explanations. The problem is vastly more difficult, the basis of subdivision less obvious, requiring biochemical discriminations of pigments, reserve food storage, etc., instead of the more obvious structural features by which animal phyla are separable. Moreover, it seems certain that in plants unicellular types will be found in several well-differentiated phyletic groups, while all one-celled animals are comprised in a single phylum. In the most critically difficult fields, of phycology and mycology, a great amount of pioneer work is still needed; botanists are still concerned with intensive studies, and, so far as fungi are concerned, the emphasis is chiefly economic. Even with the vascular plants, it is only within the past forty years that the anatomical and paleontological groundwork upon which a phyletic grouping may rest, has been accomplished.

"Acceptance of the view that various series of algae are more or less independent of each other means that both the Thallophyta and its subdivision Algae must be abandoned as natural units in classifying plants." From this premise, Professor Smith proceeds to carve nine phyletic groups out of the heterogeneous Thallophyta: Chlorophyta, grass-green algae; Euglenophyta, euglenoids; Pyrrophyta, cryptomonads and dinoflagellates; Chrysophta, the yellow-green algae (diatoms, etc.); Phaeophyta, or brown algae; Cyanophyta, blue-green algae; Rhodophyta, red algae; Myxothallophyta, slime molds; and Eumycetes, or fungi. The subdivision of the true algal groups follows lines which have been more or less anticipated by other writers, like Tilden, and is based upon the biochemical studies of men like Willstätter, etc. It is surprising to find no acceptance of the widely held opinion that the fungi themselves are polyphyletic, and that some fungi have real genetic relationships with certain algal groups. Bacteria are not included in the classification.

With his opinion that the higher vascular plants have been derived from Bryophyta, Dr. Smith recognizes that a majority of botanists will disagree. On the other hand, it is suggested here that while the great majority of general texts in botany are in agreement with Smith in keeping Pteridophyta and Spermatophyta as distinct phyla, the weight of evidence from plant anatomy and morphology and from paleobotany of the last forty years is preponderant for the conclusion expressed by Eames recently ("Vascular Plants. 1936"): "Seed habit can not be used to separate the vascular cryptogams from the phanerogams because of seeds found on the ancient group of fern-like plants." In other words, while the thallophyte miscellany has been long in need of subdivision, two other plant "divisions," Pteriodophyta and Spermatophyta, may just as reasonably be joined to form the Tracheophyta.

Finally, the importance of working toward a natural system of subdividing the plant kingdom is urged upon the authors of botanical texts and also on "botanical biologists." Such a division of Thallophyta as is presented by Smith is a distinct step in advance of present practice. It is not really more difficult to treat of nine phyletic divisions of the plant kingdom than to keep Thallophyta and then discuss its nine subdivisions.

R. C. BENEDICT

BROOKLYN COLLEGE AND
BROOKLYN BOTANIC GARDEN

SOCIETIES AND MEETINGS

THE TENNESSEE ACADEMY OF SCIENCE

THE forty-second meeting of the Tennessee Academy of Science was held at Vanderbilt University on November 25 and 26, 1938. The first general session was on Friday morning from 9 o'clock to noon, President Jesse M. Shaver presiding. Friday afternoon sec-

tional meetings were held, with Dr. Philip Rudnick chairman for physics, Dr. L. C. Glenn for geology and Dr. H. M. Jennison for botany. At the academy dinner on Friday evening Dr. George R. Mayfield, of Vanderbilt University, was toastmaster, President Shaver made an address on the subject, "How to make a Great Man," and Professor D. M. Brown, of the State Teachers College, Johnson City, presented a moving picture of "Rhododendron Gardens of Roan Mountain." On Saturday morning the second general session was held, Vice-President Aaron W. Dicus presiding, and the reading of papers was resumed. Classification of the papers on the program shows fourteen from two universities, ten from three colleges for teachers, eight from other schools, nine from federal and state organizations, and three from other sources.

On adjournment at 12 o'clock, Saturday, President Shaver called the members to order for the annual business meeting. The report of the secretary showed the membership practically the same as one year ago—430, including 69 fellows and 34 annual members of the American Association for the Advancement of Science. The appointment of a boy and girl from science clubs in the state for annual honorary junior membership in the association was placed in the hands of the executive committee. A resolution was adopted thanking Governor Gordon Browning for his efforts in the line of state conservation during the past two years and requesting Governor-elect Prentice Cooper to continue the work under his administration. Nineteen applicants were elected to membership in the academy. Officers elected for the year 1938–39 were:

President, Aaron W. Dicus, Tennessee Polytechnic Institute, Cookeville.

Vice-President, William M. Mebane, State Teachers College, Murfreesboro.

Secretary-Treasurer, John T. McGill, Vanderbilt University.

Officers of the Sections: Botany—*Chairman,* George R. Gage, Vanderbilt University, and *Secretary,* Chester P. Freeman, State Teachers College, Memphis; Geology—*Chairman,* George M. Hall, University of Tennessee, Knoxville, and *Secretary,* Kendall E. Born, Department of Geology, Nashville; Physics—*Co-chairmen,* Kenneth E. Hertel, University of Tennessee, Knoxville, and Newton Underwood, Vanderbilt University.

The 1939 spring meeting of the academy will probably be at some point in West Tennessee, the locality and date to be fixed by the executive committee.

JOHN T. MCGILL,
Secretary

THE INDIANA ACADEMY OF SCIENCE

THE fifty-fourth annual meeting of the Indiana Academy of Science was held at West Lafayette, Indiana, on November 3, 4 and 5, 1938, with Purdue University as host, and President Eli Lilly, of Indianapolis, in active charge. The first general session was largely devoted to honoring Dr. Joseph Charles Arthur and Dr. Stanley Coulter, both emeritus professors of Purdue University and former presidents of the academy. Dr. Frank D. Kern, dean of the Graduate School, Pennsylvania State College, paid tribute to Dr. Arthur in an address, "The Life and Work of Joseph Charles Arthur," and Dr. Ray C. Friesner, Butler University, honored Dr. Coulter with "A Tribute to Dean Stanley Coulter."

A total of 29 papers was presented at the general meetings and the nine divisional meetings. The attendance at these meetings was 450. Special action was taken by the academy to put into operation at the next annual meeting the plan for giving honorable mention to the authors of outstanding papers presented at the meeting.

The annual dinner meeting was attended by 250, following which President Lilly gave his president's address on "A Plan for Accomplishing More Effective Research." The officers chosen for 1939 are: T. G. Yuncker, DePauw University, *President*; Louis A. Test, Purdue University, *Vice-President*; William P. Allyn, Indiana State Teachers College, *Secretary*; William P. Morgan, Indiana Central College, *Treasurer*; Paul Weatherwax, Indiana University, *Editor of the Proceedings*; Will E. Edington, DePauw University, *Press Secretary.* The divisional chairmen for 1939 are: Paul Weer, Indianapolis, Archeology; W. A. Jamieson, Indianapolis, Bacteriology; Winona Welch, DePauw University, Botany; Herman T. Briscoe, Indiana University, Chemistry; Thomas M. Bushnell, Purdue University, Geology and Geography; P. D. Edwards, Ball State Teachers College, Mathematics; R. B. Abbott, Purdue University, Physics; F. B. Knight, Purdue University, Psychology; C. P. Hickman, DePauw University, Zoology.

The entomologists and taxonomists of the state held their meetings on Saturday, the latter group conducting a symposium on "The Concept of the Species."

The Junior Academy of Science also held its meetings on Saturday with an attendance of 250, representing forty high-school science clubs. A number of exhibits and demonstrations of the work of the high-school science clubs of the state was shown and also nine papers were read. Dean Howard E. Enders, Purdue University, is academy sponsor for the Junior Academy.

WILL E. EDINGTON,
Press Secretary.