BOTANY

Chairman: RALPH M. KRIEBEL, Bedford

R. E. Cleland, Indiana University, was elected chairman of the section for 1941.

ABSTRACTS

A biotic view of Indiana. RALPH M. KRIEBEL, Bedford.—Indiana is examined as a biological unit. Consideration is given to the physiographic and ecologic areas with their varying conditions of topography, soil, water, plants, and animals. Attention is directed to the individual characteristics of factors which may be independent of one another, yet unite to form a higher unity, an organism. It is pointed out that the biological possibilities of Indiana have already been overstepped by the exploitation of resources, agricultural practices, and socio-economic enterprises. Changes which have come about in plant and animal communities and in soils are reviewed. Special reference is made to some biological features concerning the flora. Methods of achieving and developing biological unity are suggested. New alignments of extension and teaching are discussed.

A contribution to the taxonomic study of the algae of Indiana. HELEN H. WELCH, Wood Junior College, Mathiston, Mississippi.—This paper is a taxonomic study of the algae of Indiana. The writer reports one genus, seventeen species, and one variety which have not been previously reported for Indiana. The writer also reports thirty not previously reported algal forms for Vigo County. These include one genus, twenty-eight species, and one variety.

Pollen spectra from three bogs on the Gillen Nature Preserve along the Michigan-Wisconsin state line. J. E. POTZGER, Butler University.—The three bogs included in the study were located along the Michigan-Wisconsin state line where Vilas County, Wisconsin, and Gogebic County, Michigan, adjoin. The forest succession was from a spruce-fir or spruce-fir-pine dominance to a sudden pine dominance (within one foot-level). This gradually changed to a pine-hemlock-birch dominance of which oak became an associate in the topmost layers. The early succession was similar to that in areas of Late Wisconsin glaciation in Indiana, but pine has declined but little in Wisconsin since it succeeded spruce and fir, while in Indiana oak has dominated for a period during which more than half of the sediments in the bogs were being deposited. The study is from the Limnological Laboratory of the Wisconsin Geological and Natural History Survey of 1940.

Studies on the viability of Liriodendron seed. ARTHUR T. GUARD, Purdue University.—A study has been made to determine whether there were any facts which could be established that would have bearing on seed collection with respect to the number of viable seed harvested. The

low viability is due in a very large measure to the absence of embryos in the samaras. Studies were made of the per cent of good seed on different trees and at various levels on the same tree. Studies were also made in regard to the difference in good seed at the base, middle and tip of individual cones. More good seed are found in the middle part of the cone. Trees varied widely in the per cent of good seed produced.

Fungus development as affected by carbon and nitrogen sources. CHARLEY L. PORTER, Purdue University.—Fungi of several species including *Diplodia zeae* were grown on a basic medium consisting of magnesium sulphate, ammonium nitrate, dihydrogen potassium phosphate, and a source of carbon. All media were sterilized in a DeKhotinsky water bath at 68° C. on three consecutive days. Dextrin and inulin were found to be the most satisfactory sources of carbon. Urea, nucleic acid, and cystine were satisfactory sources of nitrogen.

Symptoms of mineral deficiency in pine. CLINTON H. HOBBS, Purdue University.—Two species of pine were grown from seed in nutrient sand cultures from which various essential elements were excluded. Deficiency symptoms for nitrogen, phosphorus, and potassium were obtained in four to six weeks, and for magnesium in three months.

Dendrographic studies on the beech, *Fagus grandifolia* Ehrh., for 1940. RAY C. FRIESNER, Butler University.—One dendrograph and two dendrometers attached one each to three trees on April 1, 1940, showed elongation of radii to begin during the week ending May 13. This coincided with the time of full expansion of the leaves. Growth continued with increasing intensity until June 17 and with decreasing intensity until July 15, after which the radii showed losses for most of the weeks but with some recoveries following rains. At the close of the observation period (October 15) recovery was nearly complete. Total increase in radii ranged from 0.928 mm. to 0.970 mm. Daily reversible variations showed the radii to be longest between 4 and 7 a.m. and shortest between 4 and 6 p.m. The extent of change in length of radii during daily variations varied from 0 during the week ending April 8, to 0.22 mm. during the weeks ending July 29 and August 5.

Relation of annular ring formation to rainfall as illustrated in six species of trees in Marshall County, Indiana. RAY C. FRIESNER and GLADYS M. FRIESNER, Butler University.—Microscopic measurements of year ring growth were made for the years 1900-1939 inclusive from eight radii from each of seventeen sections of *Quercus borealis maxima* (Marsh) Ashe; 4 sections of *Q. alba* E.; 6 of *Fraxinus americana* L.; 2 of *Acer saccharum* Marsh. and 1 each of *Carya cordiformis* (Wang.) K. Koch and *Liriodendron tulipifera* L. Three trees of *Q. borealis maxima* showed highest correlation (63, 66 and 83%) between radial growth and rainfall for the calendar year; 3 showed highest correlation (75, 80, 86%) with rainfall for the vegetative year, viz. November to October; 4 showed highest correlation (71, 75, 77, 81%) with rainfall for May to August; 4 showed highest correlation (54, 62, 63, 67%) with rainfall for June; and 1 showed highest correlation (71%) with rainfall for June to August. All four trees of *Q. alba* showed a strong correlation (68 to 77%) with the rainfall

for June but three of them also show a similar correlation with rainfall for June to August and the same three show nearly as high a correlation (67 to 76%) with rainfall for May to August. One tree shows the highest correlation for the species (79%) with rainfall for November to October. All specimens of *Fraxinus americana* show high correlation (68 to 80%) with rainfall for either May to August or June to August. One specimen of *Acer saccharum* showed highest correlation (70%) with rainfall for June and the other showed highest correlation (81%) with rainfall for May to August. *Carya cordiformis* shows highest correlation (69%) with rainfall for June and *Liriodendron tulipifera* shows highest correlation (89%) with rainfall for the calendar year. However, the last species also shows 71 and 74% correlation, respectively, for May to August and June to August.

A technique for the study of the respiration of excised corn roots under asceptic conditions. RAYMOND E. GIRTON. Purdue University.—Corn grains were sterilized in sodium hypochlorite solution and germinated on sterile agar at room temperature. After germination, the roots were cut off asceptically and transferred to nutrient solutions in sterile respiration chambers. Moist carbon-dioxide-free air was led into each respiration chamber through a sterile cotton filter to prevent the entrance of micro-organisms. Upon leaving the respiration chamber, the air again passed through a sterile cotton filter which served as an additional protection against contamination. Respiratory activity was determined by absorption of the respired carbon dioxide in alkali which was then titrated. By this means it was possible to obtain continuous records of carbon dioxide production from sets of 50 sterile roots each for periods of 100 hours or longer.

Kodochromes of some spring flowers of the San Francisco Bay region. RAYMOND E. GIRTON, Purdue University.—This set of twenty-four slides represents some of the common wild flowers of the Berkeley hills and Mount Tamalpais region. Four of the slides are of rhododendrons under cultivation in the San Francisco Golden Gate Park.

Microphotography as an aid in the identification of pollen grains. HOWARD R. YOUSE, DePauw University.—The importance of the identification of pollen grains to botanists, geologists, entomologists, horticulturists, and medical men makes the above study very essential. The present limitations and future possibilities of microphotography as an aid in the identification of pollen grains was discussed.

Some algae, fungi, and hepaticae previously unreported from Indiana. FLOYD S. SHUTTLEWORTH, Indiana University.—Algae being reported for the first time from Indiana are *Symploca muscorum* and *Phacotus lenticularis*. The latter, a bivalved unicellular member of the Volvocales, has previously been reported from Iowa, California, and Lake Erie in this country and from Europe. Among the Ascomycetes being reported for the first time are *Catinella nigro-olivacea* and *Coryne urnalis*. The liverwort *Blasia pusilla* was found to be abundant near Trevlac, Brown County. This is the first report of this genus from the state. Notes on

the distribution and morphological features concerning each species are given.

A Rare Myxophycean, *Lyngbya purpurea* Gomont, at Richmond, Indiana. LAWRENCE J. KING, University of Chicago.—*Lyngbya purpurea* Gomont, a species very rarely found, is now reported for the first time for North America. The species is quite sharply defined because of its color and its small size. The only other published records are for Kerguelen's Land in Antartica by J. D. Hooker in 1845, and for Tanganyika Sea in Africa by G. S. West in 1907. The only North American station known for it to date is in the spray pond of an ice company at Richmond. Associated species of Myxophyceae found in the pond are also listed.