

BOTANY

Chairman: R. E. CLELAND, Indiana University

Professor R. C. Friesner, Butler University, was elected chairman of the section for 1942.

ABSTRACTS

Taxonomic and phylogenetic peculiarities of *Oenothera*. RALPH E. CLELAND, Indiana University.—*Oenothera* (sub-genus *Onagra*) has been for many years the despair of the taxonomist who finds among the welter of intergrading races a few distinctions which can be considered of specific significance. Assemblages that can with a clear conscience be called "species" are conspicuous by their absence; on the other hand, the almost infinite variety shown by the sub-genus makes it impossible to group all forms into a single species. It was shown that the difficulties in the way of the taxonomist are due to the peculiar cyto-genetic situation in this group. This situation was explained and the taxonomic implications pointed out. It may be doubted whether species in the accepted sense exist in the group, and it is unlikely that distinctions of phylogenetic significance can be made by other than cyto-genetic means.

Variations in *Cynodon dactylon* (L.) Pers. CHARLES M. EK, Kokomo.—This paper presented observations of three colonies of Bermuda grass in different alleys of Kokomo, Indiana, made during the past three summers. The various manuals state that this grass has 3-5 spikes 2-5 cm. long, whereas there may be 6-10 spikes (rarely 11-14) 5-10 cm. long. Deam states the limit of leaves to be 3 mm. wide and 10 cm. long but leaves 5-6 mm. wide and 25 cm. long were observed.

Elongation of the primary axis in four species of pines. RAY C. FRIESNER, Butler University.—Measurements of terminal internodes in 50 specimens each of *Pinus strobus*, *P. banksiana*, *P. sylvestris* and *P. resinosa* were made weekly from April 1 until September 25, 1941. Elongation in all species began during the week ending April 14 and in every individual some form of grand period was exhibited, but the curve was always unsymmetrical; i.e. if the rise to the peak was rapid, the fall from the peak was slow, near-peak rates often being maintained for 3 or 4 weeks; on the other hand, if the rise to the peak was slow, occupying several weeks, the fall from the peak was rapid. *Pinus banksiana* and *P. sylvestris* reached their peak in growth rate in most individuals during the week ending May 4. This was true of 100% of the individuals in the former and 74% in the latter species. In *P. strobus* peaks in elongation rate came during week endings as follows: May 4, in 6% of the individuals; May 11, 18%; May 19, 14%; May 26, 38%; and June 2, 24%. In *P. resinosa* the peaks were May 11, in 2% of the individuals; May 19, 28%; May 26, 60% and June 2, 10%. In all species elongation came to a standstill or nearly so for the majority of individuals during the week ending June 16. The period during

which zero or near-zero growth was reached ranged from June 2 for a single individual of *P. banksiana* and one of *P. sylvestris* to July 17 for two individuals of *P. strobus*, two of *P. resinosa* and one of *P. sylvestris*. After a brief period of inactivity elongations of from 1 to 8 mm. weekly were noted for individuals of all species until the week ending September 25. This post-zero activity is attributed to bud formation and elongation.

Dendrometer studies on six species of deciduous trees in Indiana for 1941. RAY C. FRIESNER, Butler University.—Dendrometers attached to two trees of *Fagus grandifolia* continuously since April 1, 1940, showed elongation of radii to begin during the weeks ending May 13, 1940, and May 12, 1941. Initiation of 1940 enlargement coincided with the time of full expansion of leaves but that for 1941 was one week later than time of full leaf expansion. During both seasons, growth continued with increased intensity, the peak being reached in 1940 during the week ending June 17 and in 1941 during the week ending June 2. Growth ended in 1940 during the week ending July 15 and in 1941 during the week ending June 9. The abrupt ending in 1941 is correlated with drought conditions. Behavior after cessation of growth consisted of losses alternating with recoveries, these being correlated with available soil water. Dormant season observations (i.e. November-April) showed similar alternating losses and recoveries. Expansion in *Ulmus fulva* began during the week ending April 21 and continued until August 26, the peak in rate being reached during the week of June 16. Expansion during the four weeks in August was only slight (0.08, 0.04, 0.04, 0.02 mm. respectively) while losses were registered throughout September. Expansion in *Quercus alba* began during the week ending April 21 and continued until July 28 with the peak coming during the week of June 30. August and September were occupied with severe losses and some recoveries but with a net loss since cessation of enlargement of 1.56 mm. in radius. Expansion in *Acer saccharum* began during the week ending May 12 and continued until July 28 with the peak in rate coming during the week of June 30. August and September were occupied with alternate losses and recoveries. Expansion in *Ulmus americana* began during the week ending April 21 and continued until September 8 with the peak in rate coming during the week of June 30. Expansion in *Fraxinus americana* began during the week of April 21 and continued until May 12. Behavior following the latter date was very erratic, periods of loss being followed by recoveries with some net gains resulting in the maximum of radius length coming during the week of July 21.

Kodachrome in the plant physiology laboratory. RAYMOND E. GIRTON, Purdue University.—A series of Kodachrome color slides was presented showing tests, apparatus, and experimental materials commonly used in laboratory exercises in plant physiology. Emphasis is laid upon materials or tests in which color is an important factor. Simplicity and economy have been the aim in the selection of laboratory material and in the photographic equipment and methods employed.

The need for simple botanical research on essential oil plants. WILLIAM D. GRAY, Miami University, Oxford, Ohio.—The probable effects of the present war upon our ability to obtain certain essential oil materials were discussed and parallels drawn with World War I. It was pointed out that the growing of essential oil plants would be a profitable venture for American growers and would also be a valuable addition to our domestic crop plants. Comparatively little is known concerning methods of cultivating essential oil plants in this country. For that reason it was urged that research dealing with such problems be attempted by botanists so that necessary information will be available to those farmers who are willing to attempt the cultivation of various essential oil plants. If such information is not obtained, early attempts at cultivation may result in failures which would discourage further experimentation along these lines.

The Lake Forest of northern Wisconsin and upper Michigan: A phytosociological study. J. E. POTZGER, Butler University.—A study was made of nine stands of hardwoods and two of pine located in Vilas County, Wisconsin and adjacent counties in Wisconsin and Michigan. The characteristic association of *Pinus strobus* and *Pinus resinosa* varies in importance of one or the other of these species with soil moisture of the habitat. *Pinus resinosa* is more prominent on dry, sandy uplands and *Pinus strobus* in moist sites. *Acer rubrum* constitutes the second layer tree stratum in the *Pinus resinosa* forest type and *Abies balsamea* in the *Pinus strobus* type. Dominants in the broad-leaved forest are primarily *Acer saccharum*, *Betula lutea*, and *Tsuga canadensis*, while *Tilia glabra* is of secondary importance in the crown cover, occurring usually in isolated clumps. *Acer saccharum* assumes more prominence in the well-drained locations and *Tsuga canadensis* in the moist lowlands, while *Betula lutea* is of equal importance in both association types. *Betula* and *Tsuga* reproduce very abundantly on old logs while the more aggressive *Acer* for some reason cannot invade decaying log habitats.

Seed production in the tulip tree. A. T. GUARD, Purdue University.—A study has been made to compare the effect of cross pollination on the production of good seed in the tulip tree. Flowers were pollinated with pollen from a tree about twenty miles distant. A comparison was made of the percentage of good seed from these flowers and those on the same tree not thus treated.

The fungus flora of an insect gall. W. H. SILVER, Purdue University.—The galls of *Pemphigus vagabundus* on poplar have repeatedly yielded several forms of *Fusarium*. *Altemaria* has also been isolated as have other fungi which are as yet unknown. Galls from trees near West Lafayette, from trees on the far south side of Chicago, and from one tree south and west of Chicago Heights, Illinois have been investigated. The inhibitory actions of some filamentous fungi and of various bacteria on the gall fungi, especially the *Fusaria*, are being investigated.