

BOTANY

Chairman: J. E. POTZGER, Butler University

Dr. Noe Higinbotham, University of Notre Dame, was elected chairman of the section for 1947.

ABSTRACTS

A pollen study in the tension zone in the Saginaw-Muskegon area of lower Michigan. J. E. POTZGER, Butler University.—Aim of the study was to discover the history of the forests along the tension zone of southern limits of the lake forest by means of pollen analyses of sediments of 12 bogs located on as well as a short distance to the north and south of this line. The pollen records show a very uniform early history in a belt approximately 25 miles to the north and the south of the tension line. Successional changes are: *Picea glauca* to *Pinus banksiana*, to a combination of *P. banksiana* and the taller pines (*P. strobus*, *P. resinosa*). In areas where the dominance of *Pinus* was replaced, or greatly modified by invasion of deciduous genera, numerous combinations of key genera appeared, viz. pine-oak; pine, oak and mixed hardwoods; pine, oak, elm, beech; pine, hemlock, beech. The southern limits of important representation of hemlock is in the zone 25 miles north of highway 46 in the central locations but swings southward at least 15 miles along Lake Michigan. It never reached more than 3 per cent of the total pollen count in bogs south of this line. An approximate successive decrease of 10 per cent in maximum oak pollen every 10 to 15 miles northward between Holland and Farwell, Michigan, the sudden decline of hemlock near the Saginaw-Muskegon line, successive reduction of importance of pine southward within the 50-mile wide belt marks the area as a very critical tension zone. This condition has persisted for a relatively long period of time. Moderating climate during the more recent past is suggested by marked increase in oak pollen representation in four bogs along the tension line.

Some observations on white pine (*Pinus strobus* L.) on Clark state forest. DANIEL DEN UYL, Purdue University.—White pine (*Pinus strobus*) although native to Indiana was not found in the forests of Clark County, Indiana. On the Clark County State Forest tree planting work started about 1904 but not until 1912 was white pine used in experimental plantings. Following these early experiments a number of white pine plantations have been established. Studies of these plantations in 1945 show that 25 year old stands support 400 trees per acre ranging from 5 to 12 inches in diameter and from 30 to 60 feet in

height. Growth of the stands is approximately one cord per acre per year.

Sporulation in the genus *Trichoderma*. O. G. WEGRICH, Purdue University.—The method by which the genus *Trichoderma* sporulates has not been described to the satisfaction of the author. It is said by other workers that spores are borne sessile, in a head and not catenate. Observations made by the author indicate that the spores are borne in a catenate manner and then adhere forming a "head-like" mass. Sporulation is described in detail with illustrations.

The bottom configuration of the Cabin Creek raised bog and the history of the forests of the region. RAY C. FRIESNER and J. E. POTZGER, Butler University.—The Cabin Creek bog differs from all other raised bogs studied to date in the complex topographic configuration over which it has spread. Borings made at 50-foot intervals on 8 radii, all of which pass through the central, deepest portion, show that the base upon which deposition was made comprised a narrow, deep central valley with steep sandy slopes on either side of which were other shallower ravines and sand ridges. The base upon which deposition began was thus considerably dissected. Correlation of character of deposits and pollen profiles shows that the deepest central depression filled in rapidly through water wash from the adjacent steep slopes and through precipitation of marl; while the ridges and more elevated areas accumulated "land-deposited" material. These depositions apparently took place simultaneously, beginning soon after the removal of the ice. The "land-deposited" material comprised wood peat, sedge peat, and sedge-wood peat. A higher percentage of the total profiles is occupied by spruce dominance than in any other bog studied. From this it is concluded that the deposition in the valleys and ravines must have been quite rapid since approximately the same time interval is involved in deposition of the lower 28 feet in the deepest depression and the lower 7 feet in the boring whose bottom was on the top of a sand ridge. Conversely, the upper levels of deposition must have occurred very slowly. Only 4 feet of deposit occurred in the valley, and 6 feet on the ridge since the close of the period of spruce dominance. The surface of the deposit on the ridge top is 10 feet above the level of the bog margin while that of the deposit in the valley is only 10 inches above the level of the margin. The close of the spruce is followed rather abruptly by a mixed mesophytic forest in which oak is more abundant than any other single genus. (To be published in *Butler Univ. Bot. Stud.* 8 (2). 1946.)

Pollen profile from a Texas bog. J. E. POTZGER, Butler University and B. C. THARP, University of Texas.—Presented in the paper is a pollen study from the 22-foot deep Patschke Bog in Lee County, Texas. Points of greatest significance are the presence of pollens of *Abies*, *Picea glauca*, *P. mariana*, and *Castanea*. The present range of *Castanea* is at least 100 miles eastward of the station. Grasses and *Alnus* play important roles in vegetational fluctuations. Variation in focal points of pollen size-classes of grasses strongly suggest that the

association of grasses was not uniformly the same for the whole period involved. Climatic changes suggested by the vegetation are: Cool-moist (boreal conifers and *Pinus*); dry-warm (*Quercus* and grasses); warm-moist (*Alnus* and *Castanea*); dry-warm (*Quercus*, *Carya*, grasses).

A five-year dendrometer record in two trees of *Pinus strobus*. RAY C. FRIESNER, Butler University.—Weekly dendrometer readings over a five-year period in Maine shows that temperature is the most important single factor involved in determining the time of initiation of radial growth in the spring. This varied from April 15 to May 26 and ranged from a few days before to as many days after the mean daily air temperature was continuously above 50° F. Awakening of radial growth closely followed the time of beginning of swelling of terminal buds. Rate and amount of weekly radial changes was irregular with no definite cycles apparent. Shrinkages due to dehydrations were correlated with periods of deficient soil moisture, but at no time were they of more than two weeks duration. During the dormant season, shrinkages and recoveries were numerous and of varying extent and duration. The average annual radial enlargement was 6.97 mm in tree A and 6.36 mm in tree B. Correlation with stumps of cut trees showed that 70 years was the average age of trees measuring around 30 inches in diameter. Amounts of radial enlargement show a fair degree of correlation with percentages of average annual rainfall, the correlation being closest when rainfall change is from well below average to average or above average. Duration of radial enlargement varied, in the two trees, and over the five-year period, from 17 to 28 weeks. Cessation of radial enlargement varied in time from the week ending September 18 to that ending November 1. There was no correlation between duration and amount of radial enlargement. (To be published in Butler University Botanical Studies 8 (1). 1946.)