

BOTANY

Chairman: NOE HIGINBOTHAM, Argonne National Laboratory,
Chicago

Dr. H. J. Brodie, Indiana University, was elected chairman of the section for 1948.

ABSTRACTS

Sexuality Studies of the Birds' Nest Fungus *Cyathus stercoreus*.
HAROLD J. BRODIE, Indiana University.—*Cyathus stercoreus* has been grown in single basidiospore culture. The single-spore mycelia are haploid and differ markedly from one another in color, texture and growth rate. Analysis of pairings of single sport cultures establishes the heterothallicism and tetrapolarity of this fungus. Whereas in most of the higher basidiomycetes, haploid mycelia are approximately equally distributed among the sex groups, in *C. stercoreus* nearly six times as many haploids belonged to the *AB* and *Ab* groups as belonged to the *ab* or *aB* groups. Vigorous diploid mycelia result from the pairing of compatible haploid mycelia. The diploids differ from one another in color, texture and growth rate. Diploid mycelia fruit readily in culture on suitable medium. In this fungus, diploidization is usually of the regular type, both haploid mycelia of a compatible pair becoming fully diploidized. An unusual kind of behavior has also been noted in which only one haploid of the pair becomes diploidized.

A haploid Oenothera. RALPH E. CLELAND, Indiana University.—Haploid Oenotheras have been found very rarely. The presence of lethals in most Oenothera genomes precludes the possibility of the existence of plants containing such genomes in single dose. Johansen is an alethal race, hence there is the possibility of the appearance of the Johansen genome in a haploid plant. In the F₁ of *Johansen* X *Haskett*, a haploid individual appeared during the summer of 1947. The plant was clearly a haploid *Johansen* plant, differing from the normal 2n *Johansen* in having thinner and narrower leaves, more slender stems and buds, and smaller stature. It was, however, a strikingly robust plant, with good color. Chromosomes at diakinesis were found for the most part as separate univalents, but a few cases were observed where two chromosomes appeared to be united end to end. Practically no pollen was found in the anthers. Many small fruits were set, with a few seed in each. Attempts will be made to grow this seed.

The progress of succession in the Pennington grove of *pinus virginiana*, J. E. POTZGER, Butler University, and ESTHER WHITNEY-POTZGER, Canterbury College.—In 1932 the senior author published a report on stands of *Pinus virginiana* in Monroe County, Indiana. These stands had developed on badly eroded and wornout fallow fields within a span of about 45 years. The seeds came from several trees which early settlers

had planted near their houses. In 1932 the ground cover was wanting and very few seedlings of broadleaved trees had come in under the crown cover of the pine. In the study of 1947 the survey showed a rather conspicuous ground cover by herbaceous plants and 26 woody species were participating in the forest complex, more than twice the number listed in 1932. The young stems are primarily those of *Quercus velutina*, *Q. alba*, *Fraxinus lanceolata*, *Carya cordiformis*, *C. ovata*, but also some young saplings of *Acer saccharum* and *Fagus grandifolia* had made their appearance. *Cornus florida* has the greatest abundance in the small tree layer, *Pinus virginiana* was not represented by a single small tree below one inch in diameter. There is every indication that in another 15 to 20 years broadleaved genera will assume control even of the crown cover. Apparently *Pinus virginiana* has within the past 60 years made sufficient favorable changes in the soil factors to make it possible for broadleaved genera to invade the stand. It seems that this pine is an excellent tree to cover and reclaim wornout and eroded areas in southern Indiana and by a process of natural succession yield to a forest of broadleaved trees.

Ecological notes on the production of Terrones in the Rio Grande Valley. ALTON A. LINDSEY, Purdue University.—A terron is a building-brick cut from natural sod held together by the interlacing rhizomes and roots of sedge-meadow species, and sun-dried. Terrones have been used for hundreds of years in the Rio Grande valley in New Mexico; they still are used extensively, chiefly by the Indians and Spanish-Americans, many of whom consider terron construction superior to adobe. The plants which determine the useful properties of terrones are, in order of decreasing abundance, *Distichlis spicata* (Saltgrass), *Juncus balticus*, *Scirpus* sp., *Anemopsis californica*. Sod, from land uncut for at least six years previously, is removed to a depth of four to six inches by spade, or special machine drawn by tractor; the bricks are stacked, and dried for at least one month. From ground not stripped within living memory, the dried sub-surface plant parts in a terron weigh 3.35% of the dry weight of the soil alone. Following terron removal, and after four growing seasons of recovery, the rhizomes and roots weigh 0.45% of the soil weight; after fourteen growth seasons they weigh 0.82% of the soil weight. The first pioneer in this halosubsere is *Flaveria campestris*, which comes in the first spring after cutting terrones. A square meter of the four-year-old stand contains 543 tufts of Saltgrass (the dominant); a square meter of the 14 year growth has 902 tufts. An equal area of uncut sod produces 891 tufts of Saltgrass, but many more plants of the several other species than occur on the younger quadrat-areas. The average compressive strength of four dry terrones tested was 194.2 lb. per square inch; the strongest of them tested 252, or slightly better than the average for adobe bricks in this region.

The identification of dried mushrooms. C. L. PORTER, Purdue University.—The paper is a result of a year of study of a collection of dried mushrooms sent to the writer for purposes of identification. Identification was made difficult and the results were uncertain because of a lack of

pertinent data accompanying the specimens. The importance of the right kind of data at the time the collection of mushrooms is made is essential. The writer gives the results of his experiences and offers suggestions for those interested in the collection and drying of fleshy mushrooms.

Variation in the Common Sunflower, *Helianthus annuus*, CHARLES B. HEISER, Jr., Indiana University.—Viewed conservatively, the annual sunflowers comprise five species. Of these, *Helianthus annuus* L. is the most complex and variable. For purposes of convenience, three main races are recognized, which are as follows: first, the sunflowers of the Great Plains and western United States which are branched, small in stature, with small disks and few rays; second, the sunflowers of the Middle West and East which are similar to the first but much taller and with larger disks and more numerous rays; third, the giant monocephalic cultivated sunflowers. The second form has somewhat the general aspect of the hybrid between the western and cultivated sunflowers. The first two are weeds and have been widely distributed by man's agency, and appear to have hybridized extensively. Hence it is hard to assign distinct geographical distributions to them. The domestic form is widely cultivated in the United States and elsewhere and crosses between it and the branched forms are not uncommon. Another factor responsible for a large amount of the diversity encountered is hybridization between *H. annuus* and other species of annual sunflowers. *Helianthus annuus* is known to hybridize with *H. Bolanderi* and *H. petiolaris*, and hybridization is suspected to occur with *H. debilis* (*H. cucumerifolius*). This hybridization has resulted in the phenomenon known as introgression and appears to have modified *H. annuus* rather extensively in the areas where the hybridization occurs. Although the writer has been engaged in a study of *H. annuus* for five years, a great deal more field and cytogenetical work still awaits to be done. These studies, it is hoped, should go a long way in throwing light upon the origin of the cultivated sunflower, one of the few new world crops to have been domesticated north of Mexico.

A study of the abscission of marcessent leaves of *Quercus palustris* and *Q. coccinea*. R. W. HOSHAWS, Purdue University.—Stem sections of *Q. palustris* and *Q. coccinea* were collected each week and studied microscopically to determine the presence and nature of the abscission region and abscission layer. Microscopic sections were prepared by means of a freezing microtome and stained for study. Observation of these sections began on 15 February, 1947. By 5 April, 1947 most of the leaves had fallen from *Q. palustris*, and by 15 April, 1947 no leaves remained on *Q. coccinea*. *Quercus coccinea* displayed the more rapid rate of leaf fall. Before abscission was complete, many petioles of both *Q. palustris* and *Q. coccinea* broke allowing the leaves to drop. The remaining petiole stubs abscissed during the following three or four days. A large number of crystals were observed in the stems and petioles of both species. However, the abscission regions contained a greatly reduced number of crystals, at the present time a study is in progress to determine the exact time of the formation of the abscission layer.