Association; Mr. David Van Shaack, of the Ætna Life Insurance Company, and others. The Association for Labor Legislation also held an important meeting on Friday afternoon on "The Unemployment Problem in America." Secretary Nagel presided.

The only criticism that could be made is that there were too many important meetings held at substantially the same time, so that it was impossible to attend them all. The general result was that one attended that meeting wherein his own personal interest lay, and thus lost the opportunity of hearing and knowing about other subjects, which frequently throw a side light previously unnoticed on one's own ideas and viewpoint.

SEYMOUR C. LOOMIS

SOCIETIES AND ACADEMIES

THE AMERICAN PHILOSOPHICAL SOCIETY

AT the meeting of the American Philosophical Society, at Philadelphia, on January 5, 1912, Professor D. W. Johnson, of Harvard University, presented a paper on "The Physical History of the Grand Canyon District."

Few points of geological interest appeal so strongly to the public as the Grand Canyon of the Colorado River. Both in the Canyon itself and in the adjacent plateaus, the geological structure most profoundly affects the scenery. The scenic features may be best appreciated if we know the succession of events in the physical history of the region which are responsible for the present surface forms. This succession was made clear by means of a series of diagrams representing various stages in the development of the district. It was shown that the ancient crystallines of the Granite Gorge, the inclined beds of the Algonkian wedge, and the horizontal strata of the Plateau series, as well as the great erosion surfaces which separate these groups of rocks, have all played a part in determining the character of the Canyon scenery; while the Plateau scenery has been profoundly affected by the north-south folds and fractures, vulcanism and long-continued erosion periods. This relation of geology to topography was shown by colored lantern views of the principal features of the district. On the basis of these views a more detailed analysis of certain events in the geologic history was presented.

THE BOTANICAL SOCIETY OF WASHINGTON

THE 77th regular meeting of the society was held at the Cosmos Club, Tuesday, January 9, 1912, at eight o'clock P.M. President W. A. Orton presided. Twenty-six members and ten guests were present. E. O. Wooton and F. D. Farrell were admitted to membership.

The following papers were read:

Botanical Gardens of the East: LYSTER H. DEWEY.

The author made a trip to Java to attend the International Fiber Congress and Exhibition held at Soerabaia in July, 1911, and visited *en route* the botanical gardens in Gibraltar, Algiers, Penang, Singapore, Buitenzorg, Hongkong and Taihoku, Taiwan (Formosa). After describing these gardens in detail the author stated that they are fulfilling a many-sided mission in attracting tourists, educating even the casual observer as to the identity of plants, indicating the sources of plant products, introducing and distributing plants of economic value and affording research workers exceptional opportunities for study.

Fermentation of Cellulose: K. F. KELLERMAN, I. G. MCBETH and F. M. SCALES. (Presented by Mr. Kellerman.)

In the formation and maintenance of humus in agricultural soils the fermentation of cellulose is probably of fundamental importance, yet our knowledge of this question is inadequate. Omeliansky's generally accepted conclusions that cellulose is destroyed only under anaerobic conditions and gives rise either to hydrogen or to methane are erroneous.

Two species of cellulose-destroying and five species of contaminating bacteria were isolated from a culture of Omeliansky's hydrogen organism, and one cellulose-destroying and two contaminating forms from his methane culture; none of the three fermenting species showed any resemblance to Omeliansky's hydrogen or methane ferments. In addition to the species isolated from Omeliansky's cultures eleven other species have been isolated from various other sources; one isolated from manure belongs to the thermophile group.

Contrary to Omeliansky's observation that cellulose-destroying bacteria do not grow upon solid media, most of the species isolated were found to grow readily upon such media as beef agar, gelatin, starch and potato. Some are facultatively anaerobic, but none are strictly anaerobic.

It is usually supposed that filamentous fungi are of little importance in agricultural soils; these investigations show them to be at least as impor-

tant as bacteria in destroying cellulose. About seventy-five species of molds have been isolated, representing a large number of genera; species of *Penicillium*, *Aspergillus* and *Fusarium* are perhaps most numerous.

In the destruction of pure cellulose, either by bacteria or molds in synthetic media, the associative action of organisms which presumably have no cellulose-dissolving enzymes frequently stimulates the growth of the cellulose organism and increases its destructive power.

Some Phases of Microscopical Detection of Decomposition in Food Products: B. J. Howard.

W. W. Stockberger,
Corresponding Secretary

THE TORREY BOTANICAL CLUB

The meeting of November 14, 1911, was held at the American Museum of Natural History at 8:15 P.M., Vice-president Barnhart presiding. Forty-five persons were present.

The minutes of the meetings of October 10 and October 25 were read and approved.

Mrs. N. C. Nuris, 611 W. 177th St., New York City, and Dr. George F. Bovard, University of Southern California, Los Angeles, Cal., were proposed for membership. There being no further business to consider, Mrs. N. C. Nuris was then elected to membership in the club.

The announced scientific program of the evening consisted of a lecture on "Trees of New York City," by Professor C. C. Curtis. The lecture was illustrated by numerous lantern slides.

B. O. Dodge,
Secretary

The meeting of November 29, 1911, was held in the laboratory of the New York Botanical Garden and was called to order at 3:40 P.M. by the acting secretary in the absence of other officers. The reading of minutes and the transaction of business were passed over and the meeting proceeded with the scientific program. The first announced paper was by Mr. Arlow Burdette Stout on "The Characteristics of the Fungus *Sclerotium rhizodes*, with special reference to its Action on the Cells of its Host," of which the following is an abstract:

Mr. A. B. Stout presented in part the results of his investigations of the fungus *Sclerotium rhizodes* Auersw., a complete report of which will soon appear in a research bulletin of the Wisconsin Agricultural Experiment Station.[1]

Special mention was made of the behavior of the fungus in the different organs of the host plant and microscopical preparations were exhibited demonstrating the relations of the fungus to the cells of its principal host *Calamagrostis canadensis*.

The fungus is coexistent in leaves, buds, stems, rhizomes and roots of the infected plants. Filaments of the fungus also form a thin weft on the exterior of the roots and extend out into the soil.

In the leaves the fungus is vigorously parasitic. In the culms fungal filaments are most abundant in the region of the nodes, but there is almost no destruction of tissues. In the underground parts of the culms, and in rhizomes the hyphæ completely digest the cell contents of cortical cells, but have no effect on the cell walls except at the points of actual penetration. In the older portions of roots the hyphæ are scattered through the cortex, where they occupy empty cells. In the younger lateral roots the filaments of the fungus are found penetrating living cells and exhibiting characteristics which have been ascribed to mycorrhizal fungi. Ultimately, however, the cell contents disappear while the fungus remains intact.

The fungus is perennial in the soil, and in the underground portions of the host. It is present in buds, but is unable to penetrate into the growing apex.

The fungus, therefore, exhibits a varying degree of parasitism in the different parts of the host.

The presentation of the second announced paper, "Studies on the Growth and Reproduction of certain Species of *Ascobolus*," by Mr. Bernard O. Dodge, was omitted on account of the illness and absence of Mr. Dodge.

Mrs. N. L. Britton exhibited drawings and microscopic preparations illustrating certain types of thickening in the cell walls of the leaves of mosses.

Dr. N. L. Britton discussed the characters of a new species of *Elæagia* from Cuba. This is a Rubiaceous shrub 8 or 10 feet high, with fruit imperfectly known. The hitherto known species of the genus *Elæagia* occur in the Andes of South America and this new plant from the mountains of Cuba forms another link in the chain of relationship between the flora of the higher altitudes of the West Indies and that of the mountains of South America.

Marshall A. Howe,
Secretary pro tem.

[1] A more complete abstract than is here given appeared in *Phytopathology*, I., 69.