

High Splint are younger than the Stockton coal, the top of the Kanawha, which the writer places, together with the Black Flint, within the Pottsville, and which at highest can not be later than the Brookville coal (base of the Allegheny), where it is now placed by Stevenson.

The further progress in the study of the fossil floras brings support to the writer's rough provisional correlation of the Harlan formation with the Anderson in Tennessee, and in part with the Charleston sandstone in West Virginia, though the lower boundaries are probably earlier in the more southern formations. The enormous expansion already noted in the southward extension of the Sewell and lower Kanawha is apparently shared by the upper Kanawha and Homewood stages in the southern Appalachian coal field.

E. O. Hovey on 'The Western Sierra Madre of the State of Chihuahua, Mexico.' The paper described very briefly some of the geologic and geographic features of the country traversed by the author in company with Professor Robert T. Hill, on a journey by pack train from Nuevas Casas Grandes southward to Ocampo (Jesus Maria) and thence northeastward to Miñaca. The great plateau of Mexico, in Chihuahua at least, has been built up on a foundation of Cretaceous limestone and schist and post-Cretaceous granite by countless volcanic eruptions of lava streams and tuff beds. The constructional surface thus produced has been leveled by atmospheric action and sheetflood erosion, and the great cañons have subsequently been cut in the elevated plateau. The Navosaigame formation of ancient local conglomerate was described and named.

On Saturday the members and others in attendance upon the meeting again divided into two sections, one under the guidance of Professor Hopkins and the other under that of Professor Fairchild. The former

continued stratigraphic and economic studies near Fayetteville, while the latter went southwestward to the Split Rock quarries of the Solvay Process Co. in the heavy-bedded Onondaga limestone about five miles from the city. From near Split Rock can be seen some of the high-level ancient channels which have suggested to Professor Fairchild his new problems in glaciology. A section of the Split Rock party continued its excursion to Skaneateles Lake and returned through the Marcellus-Cedarvale glacial channel and the Onondaga valley to the city. Other places of interest visited by members were the serpentine dike in the northeastern part of the city and the extensive salt works.

Before adjournment the section passed a hearty vote of thanks to the City of Syracuse, Syracuse University, the University Club, the Citizens Club and the City Library Association, and expressed its appreciation of the labor in behalf of the meeting expended by Professors Hopkins and Fairchild. About fifty persons, half of whom were members or prospective members, attended the various excursions and sessions, aside from the number in attendance upon the public lecture.

EDMUND OTIS HOVEY,
Secretary.

SCIENTIFIC BOOKS.

Die Lichtsinnesorgane der Laubblätter. By G. HABERLANDT. Leipzig, Wilhelm Engelmann. 1905. Pp. 142, pl. 4.

In this work, Haberlandt has brought together the results of his extensive studies of the perception of light by the leaf, some of which have already appeared in his 'Physiologische Pflanzenanatomie' and in various papers. The book is one of great interest and it should be read by every botanist concerned with the relation of plants to stimuli. A critical reading, however, is very necessary, since the text contains much special pleading. The author rejects Sachs's view that heliotropic

stimulation is due to the direction of the rays of light, and not to differences of light intensity. In its place he advances the hypothesis that the direction of the light can act but indirectly by producing differences of intensity. In support of this view, it is assumed that the perception of light stimuli is localized in the upper epidermis, and that the arched epidermal cells of *Ficus*, *Hedera*, *Magnolia*, *Oxalis*, etc., and the so-called ocelli of *Fittonia*, *Impatiens* and *Peperomia* serve as definite sense organs for perceiving light. The author proves experimentally by photographic prints of the epidermis that these sense-organs concentrate the light upon or near the cytoplasm of the inner epidermal wall. Further than this, his exposition, as he himself states, 'oftentimes possesses a purely hypothetical character.' The facts gained by the author's experiments are a valuable addition to our knowledge of the intimate details of the reception of light by the leaf. As a whole, however, the book contains far too much speculation, and is too much pervaded by an obvious bias in favor of 'sense-organs.' It is an excellent example of first-class experimental work marred by unscientific treatment of the results obtained.

FREDERIC E. CLEMENTS.

THE UNIVERSITY OF NEBRASKA.

Soil Bacteria and Nitrogen Assimilation. By FREDERICK D. CHESTER. Bulletin 66 (Nov., 1904), Delaware College Agricultural Experiment Station, Newark, Del.

In a bulletin bearing the above title Frederick D. Chester records his experiments with free nitrogen-assimilating bacteria. He states that nitrogen-fixing bacteria are present in all soils. Some fix nitrogen more actively than others. These microbes are stimulated to greater activity by free soil tillage, due to the fact that they are essentially aerobic and frequent stirring up of the soil supplies them with the necessary oxygen (air). Since these low organisms further require organic matter and lime for their food, he advises the liberal supply of these articles to the soil in order that the organisms may multiply rapidly and fix the free nitrogen of the air more actively for the use of higher plants. The more tech-

nical side of the paper deals with the methods of technique and the culture characteristics of the microbes described. The first part of the paper is historical, reviewing largely the European work along similar lines. It is an exceedingly interesting paper and the reader is advised to consult the original.

ALBERT SCHNEIDER.

SCIENTIFIC JOURNALS AND ARTICLES.

The American Naturalist for August contains the following papers: 'A Systematic Study of the Saliaceæ,' by D. P. Penhallow, containing, among other conclusions, that the Saliaceæ as a whole is an old world family with a strong tendency to a boreal habitat, and the present tropical and subtropical members of the group probably represent the relics of a wider distribution in Cretaceous and Tertiary time. 'Developmental Stages in the Lagenidæ,' by J. A. Cushman. The writer considers that Hyatt's laws of development may be applied to the Foraminifera and that where young individuals can be obtained their relations are usually made out with ease. B. M. Davis gives the seventh of the series of 'Studies on the Plant Cell,' accompanied by a bibliography of papers referred to in section V.

The Popular Science Monthly for September has the following articles:

CHARLES KEYSER EDMUNDS: 'China's Renaissance.'

FRANK LINCOLN STEVENS: 'The Science of Plant Pathology.'

J. MADISON TAYLOR: 'Sleep and its Regulation.'

C. W. FOULK and R. F. EARHART: 'State University Salaries.'

EDWIN RAY LANKESTER: 'Nature and Man.'

CHAS. D. MARX: 'General Education for Engineers.'

DUDLEY F. SICHER: 'Quackery.'

LAWRENCE J. BURPEE: 'How Canada is solving her Transportation Problem.'

EDWARD J. BERRY: 'The Ancestors of the Big Trees (Sequoias).'

SOCIETIES AND ACADEMIES.

RECENT FOLK-LORE MEETINGS IN CALIFORNIA.

The first regular meeting of the Berkeley Folk-Lore Club, founded May 3, 1905, was