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 technical 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