Clear Creek canyons and those of the later Chuar beds in Nankoweap and Kwagunt valleys on the east side of the Grand Canyon were mapped in detail. Entrance to the Nankoweap and Kwagunt area was made by a trail built sixty years ago for Major J. W. Powell and used by Dr. C. D. Walcott in 1880 when he studied the Algonkian of this district. Extensive suites of specimens were collected from both the Unkar and Chuar for laboratory studies of the sedimentary and igneous rocks. Mr. Van Gundy is now at the Grand Canyon mapping exposures of the Unkar on the south side of the Colorado River below Grand View and Desert View. Field work on the project will be continued in 1934. This work, with Noble's on the Shinumo Quadrangle, will complete the mapping and study of the Algonkian formations of the Grand Canyon. Professor Hinds and Mr. Van Gundy also examined exposures of the Mazatzal quartzite near Natural Bridge and Del Rio, central Arizona, and of the Apache group at Roosevelt Dam, near Globe and Miami, and in the Sierra Ancha to compare them with the Algonkian of the Grand Canyon.

THE Sun Yat-sen Institute for Advancement of Culture and Education, a new research institute, has been organized at Shanghai in memory of Sun Yat-sen. The following officers have been installed: *Chairman,* Board of Directors, Mr. Sun Fo (president, Legislative Yuan); *Secretary General,* Mr. Yeh Kung-cho (former Minister of Communications in Peiping and Minister of Railways in Nanking); *Directors,* Dr. Tsai Yuan-pai (president, Academia Sinica), Dr. H. H. Kung (former Minister of Industries and now president of Central Bank), General Wu Techen (mayor of Shanghai), Mr. Tai Chuan-hsien (president, Examination Yuan), Mr. Sze Liang-chai (proprietor of *Shun Pao Daily News*), Mr. Usang Ly (president, Chiaotung University) and Mr. Chen Hung-nien (former Vice-Minister of Railways, now president of Chinan University). These above directors, together with the chairman and the secretary general, form the presidium, but there are other directors besides these. The institute is divided into three departments: Research Department—director, J. Usang Ly, co-director, D. K. Lieu; Editorial Department—director, Sze Liang-chai, co-director, Chen Ping-ho; Business Department—director, Li Ta-chao, co-director, Li Ken. The National Government and the Shanghai City Government have promised to contribute monthly to the support of the institute. These two sums total $650,000 a year. At present the institute has on hand a sum of approximately $50,000. As the institute is organized in memory of Dr. Sun Yat-sen, the research program will have some bearing on his teachings, such as rural economy, proper utilization of capital, local self-government, the labor question and Chinese social psychology.

THE eighteenth annual meeting of the Optical Society of America will be held from October 19 to 21 at the Inn at Buck Hill Falls, Pennsylvania. The meeting is also open to non-members. Buck Hill Falls is in the Pocono Mountains near Stroudsburg. The inn can be reached conveniently by automobile or rail from all the principal cities of the East. It has ample accommodations for the meetings, plentiful facilities for quiet recreation, including fishing, swimming, riding, tennis and golf. At the time of the meeting the autumn coloring of the woods should be at its best. In addition to the usual program of papers contributed by members on their own initiative, the meeting will include the following special features: (1) A program of invited papers on "A Century of Photography." Announcements of the complete details will be made in the final notice of the meeting, which will be mailed early in September. It is expected that the program will include papers by eminent authorities on "The History of Photography," "The Reproduction of Tone Values," "Color Photography," "The Development of the Photographic Objective," "Color Sensitivity of Photographic Materials," "The Photographic Recording of Sound," "Photographic Photometry." (2) A group of invited papers on "The Properties of Evaporated Metal Films," a subject of timely interest in the determination of the optical constants of metals and in the production of reflecting surfaces of high efficiency in various spectral regions. (3) The presentation of the Frederic Ives Medal for 1933 to R. W. Wood, professor of experimental physics, the Johns Hopkins University, at a dinner to be given in honor of Professor Wood.

# DISCUSSION

## OUR COMMON NUMERALS

MILLIONS now use our common numerals daily and hence it is natural that their origin has become a subject of wide interest in this age of increasing scientific inquiries. While no universally accepted theory has yet been advanced it may be desirable to consider from time to time the latest serious efforts along this line, especially since undue confidence has frequently been expressed in the views of those who jumped at conclusions before a sufficient number of

evidences were available. A theory which differs widely from the one commonly expressed in our histories of mathematics and elsewhere but which is supported by a sufficient number of historical evidences to command the respectful attention of some who made a special study of this subject was recently published in a pamphlet of 51 pages, which appeared under the title "Die Entstehung unserer Ziffern," 1932, by V. Goldschmidt, Heidelberg, Germany.

According to this theory, our common numerals originated in Egypt and came into Europe through the western Arabs. Traces of the positional values of the digits are here supposed to appear in the hieratic writings of the ancient Egyptians whose number symbols are here regarded as the prototypes of our modern numerals. It is well known that the Arabs, who commonly used number words instead of number symbols, sometimes placed a dot above a digit to represent tens, two dots to represent hundreds, etc. V. Goldschmidt assumes that our common positional values of the digits are due to the observation that these dots could be omitted without ambiguity, in view of the fact that the relative positions of the digits are equivalent thereto. He regards the Hindu numerals as variants of the ancient Egyptian hieratic number symbols and hence gives no credit to India as regards our common numerals, while such credit ascribed to them by others has been commonly regarded as their chief claim for mathematical distinction.

This disaccord may serve to emphasize the fact that the extensive literature devoted to the consideration of evidences supporting the Hindu origin of our common numerals has not yet removed all the obstacles in the way towards establishing this theory on a firm basis. At any rate, the complacency with which many writers accepted this theory is not justified at the present time. Even in such a valuable work as Felix Klein's "Elementary Mathematics from an Advanced Standpoint," 1932, it is stated, page 80, that "the Hindus, especially, played a mathematical rôle as creators of our modern system of numerals, and later the Arabs, as its transmitters." The noted work by V. Schmidt will probably tend to create a better atmosphere for the progress of knowledge along this line, especially since other writers, including N. Bubnow, recently also tried to prove that our common numerals could not have originated in India.

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## UNITS OF PLANT SOCIOLOGY

THE long-standing confusion in phytogeographic and phytosociologic nomenclatures has been largely cleared up by certain European ecologists. Recognizing that a classification should be carried through on a single, consistent set of principles, these Europeans have sharply differentiated between the nomenclature of geographic categories and that of sociologic categories. And while phytogeographic divisions must be correlated with phytosociologic units, they are not and can not be coterminous in area or in conception or in terminology. That this is not yet fully understood is shown by the remark of a recent reviewer.[1] After naming the larger geographic units of Braun-Blanquet[2] (region, province, sector, district), Dr. Gleason remarks, "Presumably the next lower step is the community complex or the association." In other words, presumably the smallest geographic unit is a sociologic unit or entity. Braun-Blanquet gives no occasion for this presumption. In fact, that is exactly what he aims to avoid. The word "association," meaning a unit stand of vegetation, should not be regarded as a geographic term. The association is a social unit, like a "herd" of cattle or a "swarm" of bees. It occupies space, to be sure, but the name of the space is not association. We have "yards" for cattle and "hives" for bees. But no geographic term has yet been invented, so far as I know, for the ground on which an association stands. But Braun-Blanquet, accepting a suggestion from Nichols,[3] advises using the term "association" both for the concept arrived at by generalization from a number of examples, and also for each example by itself—as, he remarks, we already use the term "house."

The association of Braun-Blanquet is the smallest sociologic unit, in the same sense that the species is the smallest systematic unit. There may be subassociations, variants, etc. Each actual living example of the association is a "stand" (comparable with the individual plant of systematic botany). The association ("species"), alliance ("genus"), order ("family") and class are strictly sociologic units. Since associations occupy space, they occur in certain phytogeographic areas. The phytogeographic units are, from least to greatest, the subdistrict, district, sector, province and region.

The association of Braun-Blanquet, and of European ecologists generally, is a much smaller unit than we in America have generally considered it. It is nearer to the society or socies of Clements, but is differently (*i.e.*, quantitatively) defined. In the "oak-chestnut" forest of Long Island, of southeastern Pennsylvania and of the vicinity of Baltimore there are several associations. There is a chestnut oak associa-

[1] H. A. Gleason, Braun-Blanquet's "Plant Sociology," *Ecol.*, 14: 70–74.

[2] J. Braun-Blanquet, "Plant Sociology." Ed. and transl. by G. D. Fuller and H. S. Conard. McGraw-Hill, New York. 1932.

[3] G. E. Nichols, "A Working Basis for the Ecological Classification of Plant Communities," *Ecol.*, 4: 11–23, 154–179. 1923.