teacher. He has thus been able to cut down his text to 160 pages and to offer his book for sale at a price corresponding to one cent per page. The large number of figures for a book of such small compass, shows that so far as possible the training is to be through the eye, and the identification of models and crystals made easy.

The order of treatment is by systems and their subordinate classes, beginning with the forms of highest symmetry; and the holohedrism, hemihedrism and tetartohedrism of forms is indicated, though made secondary. The systems of nomenclature of Weiss, Naumann and Miller are used side by side. The relationships of the forms belonging to classes within the same system are indicated by tables and diagrams, in which the apparently holohedral forms and those which bring out in their development the real symmetry of the group, are sharply differentiated.

The six pages devoted to compound crystals will seem to many inadequate, in view of the great prominence of twins in the case of a large number of species. Not the least valuable part of the work is an appendix giving a tabular classification, which shows the symmetry elements and the simple forms of each of the thirty-two classes of crystals.

William Herbert Hobbs.

## *SCIENTIFIC JOURNALS AND ARTICLES.*

*The American Naturalist* for November contains three long papers: 'Variation in the Number of Seeds of the (American) Lotus,' by Raymond Pearl; 'The Causes of Extinction of Mammalia,' by Henry F. Osborn; and 'A Preliminary Study of the Finer Structure of Arcella,' by Joseph A. Cushman and William P. Henderson. Professor Osborn's paper, which is to be continued, discusses seriatim the external causes, such as variations in climate, increasing cold, heat or moisture, with their concomitant changes in plant and insect life; and the relations of plants and insects to mammals, with their bearing on extinction. Discussion is desired and criticisms and suggestions will be welcomed. Messrs. Cushman and Henderson show that the generally accepted idea of the structure of the test of *Arcella* is incorrect, and that the framework instead of consisting of simple hexagons, touching one another at their sides, consist of hexagons touching at their angles and thus leaving triangular interspaces which permit the interpolation of new columns of hexagons as growth proceeds. There are many ichthyological notes, while those relating to botanical publications are, as usual, numerous.

*The American Museum Journal* for October is termed the Sponge Number, the principal article being 'A Guide to the Sponge Alcove in the American Museum of Natural History,' by Roy W. Miner. This is well written and well illustrated. Incidentally, it may be remarked that it is very difficult to find in any text-book a consecutive definition of a sponge; we are told all about the structure and embryology of sponges, but what a sponge really is and its position in the animal kingdom has to be gathered by much reading. The *Journal* contains brief reports of several of the Museum expeditions, including those to Tahiti, Colorado, North Carolina and East Africa.

*The Museum News* of the Brooklyn Institute for December has articles dealing with 'The Question of Common Names' and, in connection with a recently installed group, 'The Golden Eagle, its Haunts and Habits.' It is noted that the museum has acquired the Ward collection of sponges and corals, the former containing 150 specimens of siliceous sponges and 660 of horny sponges; the latter comprising 234 species of corals. The collection of sponges was brought together by the late Professor Henry A. Ward and is extremely valuable from both the scientific and the popular standpoint, comprising as it does selected specimens from many years of collecting. The leading article of the Children's Museum section, under the title of 'General and Mrs. Green,' deals with two bullfrogs that have lived in the museum for four years.

## *SOCIETIES AND ACADEMIES.*

### THE AMERICAN PHYSICAL SOCIETY.

The fall meeting of the Physical Society was held in Chicago on December 1. In the absence of President Barus, Past-president A.

A. Michelson occupied the chair. The meeting was well attended, members coming not only from the vicinity of Chicago, but also from points in Kansas, Iowa, New York and Nebraska, more than five hundred miles distant.

A resolution was adopted urging upon the council the desirability of holding a regular yearly meeting in Chicago or some other suitable point in the middle west.

The following papers were presented:

JOHN E. ALMY, University of Nebraska: 'Spark Discharges in Gases and Vapors.'

BRUCE V. HILL, University of Kansas: 'On the Magnetic Behavior of Certain Alloys of Nickel.'

FREDERICK E. KESTER, Ohio State University: 'An Experimental Gyroscope for Quantitative Work.'

R. A. MILLIKAN and GEORGE WINCHESTER, University of Chicago: 'Upon the Discharge of Electrons from Ordinary Metals under the Influence of Ultra-violet Light.'

A. B. PORTER, Chicago: 'An Inanimate Demon.'

A. B. PORTER, Chicago: 'On Multiple Crossed Gratings.'

A. A. MICHELSON, University of Chicago: 'On the Ruling of Diffraction Gratings.'

H. G. GALE, University of Chicago: 'The Effect of Temperature on Metallic Spectra.'

C. E. MENDENHALL and L. R. INGERSOLL, University of Wisconsin: 'The Radiation Constants and Temperature of the Nernst Glower.'

K. E. GUTHE and C. L. VON ENDE, University of Iowa: 'Standard Cells.'

F. L. BISHOP, Bradley Polytechnic Institute: 'Heat of Dilution.'

LAWRENCE E. GURNEY, University of Idaho: 'The Viscosity of Water at Low Rates of Shear.' Introduced by A. A. Michelson.

FREDERICK E. KESTER, Ohio State University: 'The Bridge Method for Comparison of Condensers.'

A. H. TAYLOR, University of Wisconsin: 'A Method for the Determination of Electrolytic Resistance and Capacity.'

C. F. LORENZ, Johns Hopkins University: 'On the Effects of the Electrical Discharge on the Acetylene Flame.'

WM. R. BLAIR, University of Chicago: 'Change of Phase due to the Passage of Electric Waves Through Thin Films and the Index of Refraction of Water for Such Waves.'

WM. W. COBLENTZ, Bureau of Standards, Washington: 'The Temperature of the Moon.' (By Title.)

F. W. VERY: 'The Temperature of the Moon.' (By Title.)

ERNEST MERRITT, Cornell University: 'Note on the Fluorescence of Sodium Vapor.'

H. V. MCCOY and W. H. ROSS, University of Chicago: 'The Relation between Uranium and Radium.'

ERNEST MERRITT,
*Secretary.*

## *DISCUSSION AND CORRESPONDENCE.*

### 'ELIMINATION' IN FIXING GENOTYPES.

TO THE EDITOR OF SCIENCE: The valuable article on this subject by Mr. Witmer Stone, in SCIENCE for November 2, contains a list of twenty-five systematists to whom certain problems were submitted. The names given are all those of well-known workers in the United States, and I wondered why Mr. Stone had made no attempt to obtain the opinions of his foreign colleagues. The reason was found in the penultimate paragraph: "Elimination has never been practised in Europe and does not seem to be understood by foreign writers." Possibly it did not occur to Mr. Stone that, if foreign writers had never practised elimination, it might have been because they had always shared his unfavorable opinion of the method, and not from any lack of intelligence. The statement, however, is incorrect; at least some of us in the British Museum, who assuredly did not get our training in systematic zoology from any other part of the world, have always practised elimination when other principles, such as the fixing of a genotype by the author or the first reviser, did not intervene. I will accept Mr. Stone's assertion that we do not seem (to him) to understand the matter; but I hope to convince him that some of us do understand it at least as well as the majority of those who have replied to his questions. While reading his article I jotted down in the margin my answer to each question, and finished doing so before turning the page. The result was as follows: My answers to questions I, II, III, IV*b*, V*a*, V*b*, V*c*, VI, VII*a*, VII*b*, VIII*a*, that is to eleven out of thirteen questions, were in agreement with the majority. In VIII*b* there was no majority,