the genius of the language. In view of these restrictions, the translation seems good, but of course, other things being equal, preference will be given to the original.

A few points of detail may be mentioned: Page 9, lines 3 and 4 should read: '. . . dass er auch für $a = a + 1$ gilt, wenn er für $a = a$ richtig ist.' Lines 8 and 9 analogously.

Page 91, the essential phrase, 'ce qui est expérience, ce qui est raisonnement mathématique' (p. 111 of original) has not been translated.

Page 92, line 2, read 'ist' instead of 'wäre.'

The original, pp. 31 *et seq.*, ascribes to Kronecker that definition of number (as a partition of all rational number into two sets) which is commonly known as Dedekind's. The translation renders all these passages impersonally, and a note calls the presentation of the text Dedekind's, as modified by Tannery.

The notes added to the translation have decided value of their own, and make it desirable either to own both editions or on their account to give the translation the preference. They are to a considerable extent bibliographic, giving excellent lists of references to other works, many of them classic, on the numerous topics which come up. In this respect alone, the notes constitute a welcome and useful supplement to the original work, which makes citations only in the most general way with almost no specific references. But they also develop in many instances mathematical treatment of points touched on in the original, which contains practically no such matter. Frequently the notes state briefly the views of others on the topic in hand, or sketch its historical development, usually with detailed references.

A good index and a fuller table of contents have been added in the German edition.

J. W. A. YOUNG.

THE UNIVERSITY OF CHICAGO,
October 17, 1904.

## THE NEW SEISMOLOGY.*

IN the old seismology the only earthquake tremors studied were those of sensible magnitude, and the records related chiefly to destructive effects. The earliest philosophy of the subject regarded the tremor chiefly as a cause, ascribing to it various geologic results, such as the uplifting of coasts and the eruption of volcanoes; and only by slow degrees did it come to be recognized as an effect, the jar communicated by subterranean rending. The new seismology employs instruments of the most delicate and sensitive character, and by their aid not only detects tremors far too faint for direct perception, but undertakes to measure in absolute terms the amplitude, period and speed of the waves and the intensity of the shocks. Its analysis discriminates earth waves of four different kinds, classifies shocks according to origin as volcanic or tectonic, and by means of its data discusses the physical condition of the earth's interior. In a volume recently issued Dutton sets forth the present condition of the science, sketching its history in outline, describing its instruments and characterizing its progress toward the solution of its more important problems. The treatise is well balanced, compact and as comprehensive as consists with adaptation to the needs of the general reader. Technicalities are avoided so far as practicable, and details are introduced only for the purpose of illustrating principles. While it does not neglect that aspect of the subject which falls within the domain of mechanics, and properly gives a major share of space to the treatment of tremors as elastic waves, it is especially strong in its discussion of the bearing of seismology on geophysics. Fortunately for the geologic as well as the general reader, the author brought to his task not only the experience acquired in monographing the Charleston earthquake, but the mental equipment resulting from prolonged study of volcanism and the greater problems of the inner earth.

The discovered blemishes of the book consist of occasional lapses, either of statement or of correlation between text and illustration. For example, the symbol $a$ (page 175), which stands for the intensity of a shock at unit

* 'Earthquakes in the Light of the New Seismology,' by Clarence Edward Dutton, Major U. S. A. [No. 14 of The Science Series.] New York, G. P. Putman's Sons; London, John Murray, 1904.

distance from its origin or centrum, is erroneously defined as 'the intensity at the epicenter'; and the diagram on page 186 indicates the intensity of a shock in the locus technically called the pleistoseist as about four ninths of its intensity at the epicenter, whereas the text shows the ratio to be three fourths. Slips of this character, which might have been eliminated by more careful revision of copy and proof, will doubtless be avoided in subsequent editions. They detract but slightly from the general value of the work, which may be commended to the public as a lucid, attractive, and at the same time scientific presentation of a subject so difficult that its modern aspect is little understood outside the circle of its special students.

G. K. Gilbert.

## *SCIENTIFIC JOURNALS AND ARTICLES.*

*The American Naturalist* for October has papers on 'The Anatomy of the Coniferales' (concluding article), by D. P. Penhallow; 'Studies of the Plant Cell, IV.,' by B. M. Davis, and 'The Affinities of the Ophioglossaceæ and Marsiliaceæ,' by D. H. Campbell.

*The Popular Science Monthly* for December contains the following articles: 'The Reclamation Service,' by F. H. Newell (deals with the problems of irrigating the arid regions of the west); 'Chinese and Japanese Immigration,' by Allan McLaughlin; 'The Status of American College Professors,' by John J. Stevenson; 'A Decade of Library Progress in America,' by William W. Bishop; 'Nature's Hieroglyphics,' by Richard S. Lull (treats of the fossil footprints of the Connecticut Valley); 'The Present Problems of Physiological Chemistry,' by R. H. Chittenden; 'The Agricultural Distribution of Immigrants,' by Robert DeC. Ward; 'The Conceptions and Methods of Psychology,' by J. McKeen Cattell. There are also shorter articles and notes on the progress of science, the latter including the two hundredth anniversary of the death of Locke and the two hundred and fiftieth anniversary of Columbia University.

*The American Museum Journal* for October is devoted mainly to an extensive and fully illustrated paper by W. Beutenmüller on 'The Insect-Galls of the Vicinity of New York City.' It also contains many notes relating to the progress of the museum in adding to or installing its collections. The number contains the index to the volume for 1904.

*The Museums Journal* of Great Britain has articles on 'A Simple Method of Drilling Glass,' 'The Museum Conference at Warrington,' 'The Hankfield Museum, Halifax,' and many notes from various museums. There is an instalment of the museum's directory of Great Britain which brings the matter down to Manchester.

*Bird Lore* for November–December contains articles on 'How to Study a Bird,' by Ernest Thompson Seton; 'Some Familiar Florida Birds,' by F. W. Roe; 'Bird Life of a Swiss City,' by Wendell Prime; and 'Young Flamingos,' by Frank M. Chapman. There is the seventh paper on 'The Migration of Warblers,' by W. W. Cooke; 'Bird Lore's Christmas Census' and Notes, Reviews, Editorials and the very full Audubon Department.

## *SOCIETIES AND ACADEMIES.*

### THE CONVOCATION WEEK MEETINGS OF SCIENTIFIC SOCIETIES.

The American Association for the Advancement of Science, the American Society of Naturalists and the following societies will meet at Philadelphia, Pa., during the week beginning December 24, 1904:

*The American Association for the Advancement of Science.*—The week beginning on December 27, President, Professor W. G. Farlow; permanent secretary, Dr. L. O. Howard, Cosmos Club, Washington, D. C.; general secretary, President Charles S. Howe, Case School, Cleveland, Ohio; secretary of the council, Professor Clarence A. Waldo, Purdue University, Lafayette, Ind.

*Local Executive Committee.*—President, Provost Charles C. Harrison; vice-president, Professor Edgar F. Smith; secretary, Dr. Philip P. Calvert; treasurer, Dr. Samuel G. Dixon; chairman of the executive committee, Provost Charles C. Harrison; of the committee on reception and entertainment, Mrs. Charles C. Harrison; of the committee on hotels and boarding houses, Professor Amos P. Brown; of the committee on meeting places and