

get as much out of Krause's work as he would out of one constructed more along the lines of Greenhill's Elliptic Functions is a matter of considerable doubt, but at any rate we have a neat and reasonably short exposition which admirably serves its announced purpose of orienting the reader in the corresponding part of Jahnke's tables. E. B. WILSON.

An Introduction to Thermodynamics. By JOHN MILLS. Boston, Ginn and Co., 1910. viii+136 pp.

The brief text on thermodynamics by Mills shows that the author has read and digested a large number and a large variety of works on the subject, and that he knows how to select from this diversity the elements he needs and combine them into a carefully coordinated sequence which shall serve to lead the pupil from his elementary work on heat through so much of thermodynamics as may be necessary for the ordinary student of engineering. The simpler notions and notations of the calculus are constantly used; a large number of numerical practical problems are worked in the text, and a set of miscellaneous exercises for the reader is furnished at the end. The style is concise, but clear, and the various physical concepts are defined with the accuracy of the physicist rather than with the frequent inaccuracy of the engineer. The titles of the chapters are: Fundamental concepts and laws, Gases, Water and its saturated vapor, Superheated steam, Flow of steam and gases. The page has that attractive appearance which generally goes with the imprint of the Athenæum Press. E. B. WILSON.

Annuaire du Bureau des Longitudes pour l'An 1913. Paris, Gauthier-Villars. 16mo.

THE editors of the *Annuaire* have clearly decided that it should be kept fully up to date. Several of the tables of constants are again improved, some by a recasting of the contents, others by the addition of new matter, and still others by the adoption of the latest and best values obtainable. Any one interested in its use will find these changes briefly but clearly set forth in the preface. The information is easy to find with the help of the full index. The main defect is a minor one and perhaps a matter of opinion: the edges are uncut and there are some 800 pages.

The Notices contain, besides the speeches made at the

obsequies of Radau and Poincaré, who had both assisted for some years in the preparation of the *Annuaire*, an article on the application of wireless telegraphy to the distribution of the daily time by Commandant Ferrié, and a resumé by M. Bigourdan of the observations made during the solar eclipse of 1912, April 17. From these we learn that the line of totality was almost exactly midway between those predicted by the *Connaissance des Temps* and the *American Ephemeris*.

ERNEST W. BROWN.

NOTES.

THE twentieth summer meeting and seventh colloquium of the American Mathematical Society will be held at the University of Wisconsin, Madison, Wis., during the week beginning Monday, September 8, 1913. The first two days will be devoted to the regular sessions for the presentation of papers. The colloquium will open on Wednesday morning and will close on Saturday morning. Courses of lectures will be given as follows (the list of principal topics is appended):

PROFESSOR L. E. DICKSON: "Certain aspects of a general theory of invariants, with special consideration of modular invariants and modular geometry."

A function-theoretic basis for a general theory of invariants applicable to both algebraic and modular invariants; concrete examples.

Geometrical derivation of a fundamental system of invariants of a binary modular group; application to the invariantive classification of binary forms.

The so-called form problem for a modular group; solution in the simple, but typical, case of two variables. Finiteness of modular covariants; examples of fundamental systems.

General modular geometry; the projective geometry and covariant theory of a conic and of a quadric surface modulo 2; certain features of the modular geometry of cubic and quartic curves and surfaces.

PROFESSOR W. F. OSGOOD: "Topics in the theory of analytic functions of several complex variables."

The lectures will attempt to give a brief survey of what