

again reduced with the azimuth and collimation constants derived from the least square adjustment. The polar stars were excluded in this last process. The adopted values of the clock correction, however, are always very nearly equal to those obtained from the least square reduction, the greatest difference being  $0^{\circ}.035$ . (Vera Cruz, 1889, January 17; p. 69.)

The latitude work was all done by Talcott's method, the star-places being derived from the *American Ephemeris*, the *Jahrbuch*, and the Catalogues of Newcomb, Safford, the Coast Survey, and Greenwich Observatory.

The volume contains excellent maps showing the surroundings of the various astronomical stations, and closes with an appendix giving the results of the many valuable magnetic observations made by the members of the Expedition.

HAROLD JACOBY.

COLUMBIA COLLEGE, New York; 1891, *September*.

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#### NOTES.

THE officers of Section A at the Washington Meeting of the American Association for the Advancement of Science were: Vice-President, E. W. Hyde of Cincinnati; Secretary, F. H. Bigelow of Washington. The following papers were read: The evolution of algebra, by E. W. Hyde; On a digest of the literature of the mathematical sciences, by Alex. S. Christie; Latitude of the Sayre Observatory, by C. L. Doolittle; The secular variation of terrestrial latitudes, by George C. Comstock; Groups of stars, binary and multiple, by G. W. Holley; Description of the great spectroscope and spectrograph constructed for the Halsted Observatory, Princeton, N. J., and Note on some recent photographs of the reversal of the hydrogen lines of solar prominences, by J. A. Brashear; Standardizing photographic films without the use of a standard light, by Frank H. Bigelow; On a modified form of zenith telescope for determining standard declinations, and On the application of the "photochronograph" to the automatic record of stellar occultations, particularly dark-limb emersions, by David P. Todd; Principles of the algebra of physics, by A. Macfarlane; The zodiacal light as related to terrestrial temperature variation, by O. T. Sherman; On the long-period terms in the motion of Hyperion, by Ormond Stone; Exhibition and description of a new scientific instrument, the aurora-inclinometer, by Frank H. Bigelow; The tabulation of light-curves: description, explanation, and illustration of a new method, and Stellar fluctuations: distinguished

from variable stars : investigation of their frequency, by Henry M. Parkhurst ; On certain space and surface integrals, by Thomas S. Fiske ; The fundamental law of electromagnetism, by J. Loudon ; Method of controlling a driving clock, by F. P. Leavenworth ; On the bitangential of the quintic, by Wm. E. Heal ; Parallax of  $\alpha$  Leonis, by Jefferson E. Kershner. The officers elected for the Rochester Meeting are : Vice-President, J. R. Eastman of Washington ; Secretary, W. Upton of Providence.

THE first volume of a work entitled “*Synopsis der Höheren Mathematik*,” by the Rev. J. G. Hagen, Director of the Observatory of Georgetown College, Washington, D. C., has appeared from the press of Felix L. Dames, Berlin. Its 400 pages treat of Arithmetical and Algebraic Analysis. The contents are as follows : Part I., Theory of Numbers—Part II., Theory of Complex Quantities.—Part III., Theory of Combinations.—Part IV., Theory of Series.—Part V., Theory of Infinite Products and Factorials.—Part VI., Theory of Continued Fractions.—Part VII., Theory of Finite Differences.—Part VIII., Theory of Functions.—Part IX., Theory of Determinants.—Part X., Theory of Invariants.—Part XI., Theory of Groups.—Part XII., Theory of Equations. The subject of the second volume will be Analytical and Synthetic Geometry. The entire work is to be contained in four volumes, which are promised at the rate of one a year.

THE deaths of a number of distinguished mathematicians have occurred since the beginning of the present calendar year. Among them may be recorded John Casey, died January 3 ; Sophie Kowalevski, February 10 ; Maximilien Marie, May 8 ; Wilhelm Matzka, June 9 ; and Wilhelm Eduard Weber, June 23. On another occasion we hope to give the readers of the *Bulletin* some account of their work and lives.

T. S. F.

WE learn from Hoffmann's *Zeitschrift*\* that on the 5th and 6th of October a meeting will be held at Braunschweig, Germany, for the purpose of organizing an “association for the improvement of the teaching of mathematics and the natural sciences.” At a preliminary meeting held at Jena, September 28 and 29, 1890,† and attended by about 90 teachers from all parts of Germany, the desirability of such an organization was discussed and fully established, and a provisional constitution

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\* *Zeitschrift für den mathematischen und naturwissenschaftlichen Unterricht*, vol. 22 (1891), pp. 316–318 and pp. 397–398.

† *ib.*, vol. 21 (1890), pp. 561–574 and pp. 611–632.

was drawn up. The association is evidently intended to represent mainly the teachers employed in the *Gymnasium* and *Realschule*, although there is, of course, no class-restriction of membership, anybody interested in the object of the society being invited to join, and university professors in particular. The term "natural sciences" is understood to embrace physics, chemistry, mineralogy, botany, zoology, and geography.

The formation of this association is a significant fact in connection with the general movement for the reform of the so called higher schools that has been going on in Germany for many years. The sensation created by the Emperor's opening address to the committee called to consider the reform of the higher schools was somewhat abated by the rather conservative final report made by this committee. But the strength of the popular movement is not broken by any means. It is the avowed object of the new association to promote and strengthen the teaching of the exact sciences in the schools of Germany. The activity of the society is to bear mainly on the following points :

(1) The improvement and more ample use of scientific apparatus and other mechanical aids to instruction (the very general term "*Lehrmittel*" may be interpreted to include also text-books).

(2) The better preparation of teachers for their calling, by the establishment of special courses and "seminaries" for elementary teachers at the universities, lectures on the teaching of elementary mathematics, etc.

(3) The application of the recent advances in science and the arts to elementary instruction in the exact sciences.

A full account of this year's meeting will probably be published in Hoffmann's *Zeitschrift*.  
A. Z.

PROFESSOR W. H. ECHOLS, JR., recently Director of the Missouri School of Mines, has been called to a chair at the University of Virginia.

Professor M. W. Harrington, for a number of years Professor of Astronomy at the University of Michigan, is now Chief of the Weather Bureau in the Department of Agriculture at Washington, D. C.

Professor A. S. Hathaway has resigned his post at Cornell, to become Professor of Mathematics at the Rose Polytechnic Institute.

Professor A. L. Baker, of the Stevens School, Hoboken, N. J., has accepted a call to the University of Rochester.

Professors A. S. Hardy, of Dartmouth, and Fabian Franklin, of Johns Hopkins, have gone abroad to remain during the present academic year.  
T. S. F.