

and in the discovery of further facts. The subject is presented in what seems to me the correct perspective, theory being subordinated to fact." The method of treatment is the interrogatory one and an effort is made to teach the student to observe for himself. While this method is an excellent one in theory it is doubtful whether it can be used with success with a class of beginners who have had no experience in scientific methods. In the early stages of the work they must be taught how to observe, and their powers of observation must be trained by showing them what they should see in each case. In some cases the important features of the experiment might be entirely overlooked and unimportant details magnified if the attention is not directed to the desired points. Of course, this might be overcome by constant personal contact with the student; but such is hardly possible in many institutions.

J. E. G.

BOOKS RECEIVED.

- Les diastases et leurs applications.* E. POZZI-ESCOT. Paris, Masson et Cie. 1900. Pp. 217.
- Aleyonium.* SYDNEY J. HICKSON. London, Williams & Norgate. 1901. Pp. viii + 22. 3 Plates.
- Lehrbuch der vergleichenden Anatomie der wirbellosen Thiere.* ARNOLD LANG. Jena, Gustav Fischer. 1901. Pp. vi + 311.
- Proceedings of the Iowa Academy of Sciences for 1899.* SAMUEL W. BEYER. Des Moines, F. R. Conway. 1900. Volume VII. Pp. 212.
- Bibliotics or the Study of Documents.* PERSIFOR FRAZER. Philadelphia, J. B. Lippincott Company. 1901. Pp. xxiv + 226.
- Thirty-second Annual Report of Births, Deaths, Marriages and Divorces in Michigan.* JUSTUS S. STERNS. Lansing, Robert Smith Printing Co. 1900. Pp. xvi + cixxii. Tables, 189.
- Laboratory Companion.* W. A. SHENSTONE. London, Edward Arnold. 1901. Pp. viii + 117.
- Theoretical Mechanics.* L. M. HOSKINS. Stanford University, Cal., published by the Author. 1900. Pp. x + 436. \$3.25.
- Reservoirs for Irrigation, Water-Power and Domestic Water-supply.* JAMES DIX SCHUYLER. New York, John Wiley & Sons; London, Chapman & Hall, Limited. 1901. Pp. xviii + 414.

SCIENTIFIC JOURNALS AND ARTICLES.

In the January number of the *Physical Review* Theodore Lyman presents the results of a study of the 'false spectra' often produced by a Rowland concave grating. These spectra are most clearly seen in the extreme ultra-violet, and are shown to be diffraction spectra of much less dispersion than the ordinary spectra. They appear to be due to errors of ruling, extending over the whole surface of the grating. A. A. Noyes describes in the same number a modification of the usual method of determining transference numbers, and applies the method to a large number of salt solutions of varying concentration. The application of interference methods to the determination of Poisson's ratio forms the subject of an article by J. R. Benton; while two articles by Chas. T. Knipp deal respectively with the employment of the bicycle wheel in illustrating the principles of the gyroscope, and with a new form of automatic temperature regulator. The former article describes a number of simple experiments with an ordinary bicycle wheel which are readily performed, and at the same time illustrate very strikingly the properties of the gyroscope and gyroscopic pendulum. Experiments are described by E. C. Roberts to determine whether the dielectric constant is altered by a magnetic field. The results are wholly negative.

THE January number of the *American Journal of Mathematics* (Vol. XXIII., No. 1), contains the following articles: 'Die Typen der linearen Complexe rationalen Curven im R_r ,' by S. Kantor; 'Transformation of Systems of Linear Differential Equations,' by E. J. Wilczynski; 'Distribution of the Ternary Linear Homogeneous Substitutions in a Galois Field into Complete Sets of Conjugate Substitutions,' by L. E. Dickson; 'Distribution of the Quaternary Linear Homogeneous Substitutions in a Galois Field into Complete Sets of Conjugate Substitutions,' by T. M. Putnam; 'On the Determination and Solution of the Metacyclic Quintic Equation with Rational Coefficients,' by J. C. Glashan; 'Construction of the Geometry of Euclidean n -Dimensional Space by the Theory of Continuous Groups,' by E. O. Lovett; 'A Table of Class Numbers for Cubic Number