Grundriss der Naturphilosophie. Von W. OSTWALD. Leipzig, Philipp Reclam, jun., 1908. 195 pp.

RECLAM'S Universal-Bibliothek is widely known as a good place to look for almost anything from Bret Harte to Kant with tolerable assurance of finding it attractively put up in small volumes at small prices. Probably somewhere between the rather wide limits just assigned would be placed Ostwald's Grundriss der Naturphilosophie; how to place it in much narrower limits is a question; it probably would hardly have appealed to Kant as philosophy or to Bret Harte as nature. There are four parts, general epistemology, logic with the theory of aggregates and mathematics, the physical sciences, and the biological sciences. The point of view throughout is that of the physicist or chemist; the philosophy is not refined, nor the mathematics logical. It is probably precisely these characteristics that will make the book readable and interesting and instructive to the general public. Any admirer of pragmatism will find much here to delight him. To any one not trained in philosophical or mathematical or scientific thinking but desirous of awakening his ideas toward science and philosophy the book is heartily to be recommended as introductory reading.

E. B. WILSON.

NOTES.

The opening (January) number of volume 12 of the *Transactions of the American Mathematical Society* contains the following papers: "An invariantive investigation of irreducible binary modular forms," by L. E. DICKSON; "An application of symbolic methods to the treatment of mean curvatures in hyperspace," by W. H. BATES; "On the order of linear homogeneous groups (fourth paper)," by H. F. BLICHFELDT; "The metrical aspect of the line-sphere transformation," by J. L. COOLIDGE; "Natural systems of trajectories generating families of Lamé," by EDWARD KASNER; "A fundamental system of invariants of the general modular linear group with a solution of the form problem," by L. E. DICKSON; "Linear difference equations and their analytic solutions," by R. D. CARMICHAEL.

Professor C. L. BOUTON has retired from the editorial staff of the *Transactions*. Professors MAX MASON and P. F. SMITH have been added to the staff as associate editors.

THE opening (January) number of volume 33 of the *American Journal of Mathematics* contains the following papers: "On a class of cubic surfaces with curves of the same species," by JOHN EIESLAND; "The automorphic transformations of the binary quartic," by A. H. WILSON; "Theorems on the simple finite polygon and polyhedron," by N. J. LENNES; "On the solutions of certain types of linear differential equations with periodic coefficients," by F. R. MOULTON and W. D. MACMILLAN. The frontispiece is a portrait of Professor ULISSE DINI, of the University of Pisa.

AT the Minneapolis meeting of the American association for the advancement of science it was decided to hold the next meeting of the association at Washington, D. C. Dean C. E. BESSEY, of the University of Nebraska, was elected president of the association. Professor E. B. FROST, director of the Yerkes Observatory was elected vice-president and chairman of Section A. The retiring vice-president, Professor E. W. BROWN, of Yale University, delivered his address on "the relations between Jupiter and the asteroids." The programme of the section consisted of astronomical papers, except at the joint sessions with the Chicago Section of the American Mathematical Society. At the Washington meeting the retiring vice-presidential address will be by Professor E. H. MOORE, of the University of Chicago.

AT the meeting of the London mathematical society held on December 8 the following papers were read: By G. H. HARDY, "Properties of logarithmico-exponential functions," and "Some results concerning the increase of functions defined by an algebraic differential equation of the first degree"; by A. A. ROBB, "Optical geometry of motion"; by T. C. LEWIS, "Note on the Pellian equation," and "A property of the number 7"; by G. B. MATHEWS, "On the arithmetical theory of binary cubic forms."

THE fifteenth meeting of the association of teachers of mathematics of the Middle States and Maryland was held at Philadelphia, November 26. The following papers were read: By

I. J. SCHWATT, "Is the average secondary school pupil able to acquire a thorough knowledge of all the mathematics ordinarily given in those schools?"; by E. H. KOCH, "Training for efficiency in elementary mathematics." Reports by the committee on mathematics in continuation schools and by the committee on a syllabus for algebra were read.

W. H. METZLER was elected president and H. F. HART secretary for the year 1911.

THE ninth regular meeting of the Rochester section of the association of the teachers of mathematics in the Middle States and Maryland was held at Rochester on December 27 in affiliation with the meeting of the New York teachers' association. The following papers were read: By C. W. WATKEYS, "Volumes as functions, with their graphs"; by C. F. WHEELOCK, "Informal discussion of mathematical work in New York State"; by F. W. Owens, "On the superposition postulate in geometry"; by W. BETZ, "Causes of failure in mathematics: report prepared for the international commission."

THE Syracuse section of the association of teachers of mathematics in the Middle States and Maryland held its annual meeting at Syracuse in affiliation with various other educational organizations on Friday, December 30, at which the following papers were read: By W. B. CARVER, "Some topics of school mathematics of especial importance to students who expect to study analytic geometry and calculus"; by C. A. SHAVER, "The new syllabus in arithmetic for New York State"; by W. SMITH, "What results are we getting from graphic algebra?"

THE New York section of the Association of teachers of mathematics in the Middle States and Maryland had a general meeting at the Hotel St. Denis in New York city January 6, 1911. After a dinner served to about 125 guests, the members heard the reports on the progress of the International commission on the teaching of mathematics made by the American commissioners, Professor D. E. SMITH, Professor W. F. OSGOOD and Professor J. W. A. YOUNG.

UNIVERSITY OF ILLINOIS. Courses offered in the second semester, 1910–1911. — By Professor S. W. SHATTUCK: Calculus of variations, three hours. — By Professor E. J. TOWNSEND: Functions of a complex variable, three hours. — By

Professor G. A. MILLER: Elementary theory of groups, three hours. — By Professor H. L. RIETZ: Theory of averages and the mathematical theory of investments, three hours. — By Professor C. H. SISAM: Algebraic surfaces, three hours. — By Professor J. B. SHAW: Vector differentials and integrals, three hours. — By Professor A. EMCH: Elliptic functions, three hours. — By DR. A. R. CRATHORNE: Theory of linear differential equations, three hours. — By Dr. G. E. WAHLIN: Partial differential equations, three hours. — By Dr. R. L. BÖRGER: Projective geometry and linear transformations, three hours.

AT the annual public meeting of the Paris academy of sciences on December 19 the following announcements were made. The grand prize of the mathematical sciences was not awarded, as no meritorious memoir on the stated problem had been received. The Francoeur prize was awarded to E. LEMOINE; the Poncelet prize to M. RIQUIER; the Binoux prize to E. LEBON. The Montyon prize in mechanics was awarded to J. GAULTIER for his inventions in connection with surveying instruments; the Fourneyron prize was not awarded. The Pierre Guzman prize was not awarded, but the accrued interest was granted to the late M. LÉVY; the Lalande prize was awarded to P. H. COWELL and A. CROMMELIN for their researches in connection with Halley's comet; the Valz prize to S. JAVILLE for his work on nebulae and periodic stars; the Janssen medal to W. W. CAMPBELL for his researches in stellar spectroscopy. The Jerome Ponti prize was awarded to H. ANDOYER for his new trigonometric tables in which the logarithms are carried to 14–17 decimal places.

THE annual meeting of the Italian association for the advancement of science was held at Naples, December 15–21, under the presidency of Professor CIAMICIAN, whose address was on "The cooperation of the sciences."

In pure and applied mathematics the following papers were read: By E. BOMPIANI, "Contribution to projective differential geometry of hyperspaces"; by M. O. CORBINO, "Fifty years after the discovery of Pacinotti's ring"; by A. GARBASSO, "The emission of light"; by A. DE NORA, "Remarks on the Müller-Breslau method of the calculation of frameworks"; by L. SILBERSTEIN, "Mutual mass of two electrons"; by C. SOMIGLIANA, "On elastic properties of the

earth"; by A. TUMMARELLO, "Types of homaloidal surfaces"; by G. VACCA, "History of mathematics in the Far East, contributions by T. HAYASHI and V. MIKAMI."

DR. M. CIPOLLA, of the University of Palermo, has been appointed associate professor of algebra at the University of Catania.

DR. E. VESSIOT, of the University of Lyon, will give a course in mathematical analysis at the University of Paris during the second semester of the present year.

PROFESSOR C. NEUMANN, of the University of Leipzig, will retire from active teaching at the end of the present semester. He will complete his seventy-ninth year on May 7.

MR. H. J. PRIESTLEY, assistant lecturer in mathematics at the University of Manchester, has been appointed professor of mathematics and physics at the new University of Queensland.

PROFESSOR G. CASTELNUOVO, of the University of Rome, and Professor U. DINI, of the University of Pisa, have been elected to membership in the royal institute of Venice.

PROFESSOR M. ABRAHAM, of the technical school of Milan, has been elected a member of the royal institute of Lombardy.

DR. H. LEBESGUE, of the University of Poitiers, has been appointed master of mathematical conferences at the University of Paris.

PROFESSOR L. LECORNU, of the Ecole polytechnique, has been elected a member of the academy of sciences of Paris.

PROFESSOR A. EINSTEIN, of the technical school of Zürich, has been appointed professor of mathematical physics at the German University of Prague.

DR. L. BIEBERBACH has been appointed docent in mathematics at the University of Königsberg.

DR. R. NEUENDORFF has been appointed docent in mathematics at the University of Kiel.

DR. H. TIETZE, of the University of Vienna, has been appointed associate professor of mathematics at the German technical school at Brünn.

PROFESSOR G. B. HALSTED has been elected corresponding member of the academy of sciences of Bordeaux.

PROFESSOR JACQUES HADAMARD, of Paris, will deliver at Columbia University in the month of October, 1911, two courses of lectures on mathematics and mathematical physics. A course of weekly lectures open to the mathematical public is also planned. Further details will be announced later.

AT the University of California, associate professor G. C. EDWARDS has been promoted to a full professorship of mathematics.

AT Princeton University Dr. G. D. BIRKHOFF has been advanced to a full professorship of mathematics.

MR. J. B. SMITH, of the University of Virginia, has been appointed assistant professor of mathematics at Hampden Sydney College.

AT the University of Pennsylvania, Dr. H. B. SMITH has been appointed instructor in mathematics to fill the vacancy caused by the temporary absence of Professor H. B. EVANS.

PROFESSOR JULES TANNERY, of the Ecole normale, died November 11, at the age of 72 years.

PROFESSOR K. LASSWITZ, of Gotha, died October 17, at the age of 62 years.

PROFESSOR JULIUS PETERSEN, of the University of Copenhagen, died August 5, 1910, at the age of 71 years.

PROFESSOR TH. N. THIELE, former director of the observatory at Kopenhagen, died September 26, at the age of 71 years.

CATALOGUES of second-hand mathematical books: A. Hermann et Fils, 6 rue de la Sorbonne, Paris, catalogues in exact and natural sciences and in physics, 1910, about 160 entries in mathematics.