

the applications which depart so slightly from the typical problems of the text-books or the class-room that they are within the reach of all who make an honest effort to do the work of the course. Moreover, as regards the choice of material, the important improvement of introducing the integral as the limit of a sum early in the first course may now be fairly regarded as achieved. And yet, with all of this that is so good and sound, if you open one of our text-books on the calculus and ask: What *is* the calculus? What will abide after the formulas are forgotten? What is the soul and the spirit of this great science, as conceived by the man whose work in life does not lie within the field of mathematics? I can't help feeling that the answer does not ring clear: The calculus is the greatest aid we have to the appreciation of physical truth in the broadest sense of the word.

NOTES.

THE fourteenth summer meeting of the AMERICAN MATHEMATICAL SOCIETY will be held at Cornell University on Thursday-Friday, September 5-6. Titles and abstracts of papers to be presented at this meeting should be in the hands of the Secretary by August 24. Abstracts intended to be printed in the announcement of the meeting must be submitted by August 17.

THE April number (volume 8, number 2) of the *Transactions* of the AMERICAN MATHEMATICAL SOCIETY contains the following papers: "Dynamical trajectories: the motion of a particle in an arbitrary field of force," by E. KASNER; "A class of periodic orbits of an infinitesimal body subject to the attraction of n finite bodies," by W. R. LONGLEY; "A proof of some theorems on pointwise discontinuous functions," by E. B. VAN VLECK; "Invariants of binary forms under modular transformations," by L. E. DICKSON; "Projective differential geometry of curved surfaces (first memoir)," by E. J. WILCZYNSKI; "A method for constructing the fundamental region of a discontinuous group of transformations," by J. I. HUTCHINSON; "Oblique reflections and unimodular strains," by E. B. WILSON; "On the introduction of convergence factors into summable series and summable integrals," by C. N. MOORE.

THE pages of "New Publications" contained in each number of the BULLETIN will hereafter be reprinted and furnished to such institutions as may desire to use them for the purpose of ordering mathematical books. Enquiries should be addressed to the Committee of Publication.

ON the editorial staff of the *Annals of Mathematics* Professor J. K. WHITEMORE will succeed Professor MAXIME BÔCHER, who is about to assume his duties as member of the Editorial Committee of the *Transactions* of the AMERICAN MATHEMATICAL SOCIETY.

AT the meeting of the London mathematical society held on April 11, the following papers were read: By H. F. BAKER, "A theorem in the theory of functions"; by H. BATEMAN, "An introduction to the metrical geometry of space of n dimensions," and "The values of the parameters for which a definite integral can be zero"; by H. HILTON, "A note on Perott's theorem"; by E. W. HOBSON, "Poisson's integral and its relations to the proof of Fourier's theorem."

THE supplementary announcement of the annual list of members of the Circolo matematico di Palermo issued in March shows that the society now has 461 active members, of whom 75 are Americans. This society was organized in the spring of 1884 by residents of Palermo; it at once became national and soon international in its scope. At present 288 of its members are foreigners. The regular sessions of the society are held on alternate Sunday afternoons. The first volume of the *Rendiconti* was issued in 1887; at least one volume has appeared each succeeding year, and during each of the years 1905 and 1906 two volumes were published. The parts appear bimonthly; they contain brief reports of the sessions and such memoirs read before the society as are appropriate. Beginning with January, 1907, the reports were transferred to the *Supplemento*, which also gives the titles of papers published in other mathematical journals. The *Annuario* contains the list of members and a complete index of all papers published in the *Rendiconti*. In the exchange list of the society are 105 periodicals, including all the important mathematical journals of the world. The society, together with the Accademia dei Lincei at Rome, will have charge of the arrangements for the

fourth international congress of mathematicians to be held at Rome next April. The present officers of the Circolo are: president, Professor M. L. ALBEGGIANI; secretaries, Professors G. DI SIMONE and E. P. GUERRA; director of the *Rendiconti*, Professor G. B. GUCCIA.

ON the occasion of the Abel centenary celebration it was decided to erect a memorial tablet to his honor, and funds were subscribed for the purpose. This plan has now been succeeded by another, for which larger means are needed. A plaster cast of a monument 40 feet high representing Abel supported by gigantic allegorical figures has been prepared, which is to be cast in bronze. The work has been done by Gustav Vigeland, perhaps the ablest sculptor in Norway. In order that this undertaking may assume an international character, mathematicians throughout the world are invited to contribute to it. The circular of invitation bears the names of a responsible committee. Contributions may be sent to Professor L. Sylow, University of Christiania, Norway.

THE following advanced courses in mathematics are offered during the academic year 1907-1908:

COLUMBIA UNIVERSITY. — By Professor F. N. COLE: Theory of groups, three hours; Theory of invariants, three hours. — By Professor JAMES MACLAY: Application of the calculus to the theory of surfaces and curves in space, three hours; Theory of functions of a complex variable, three hours. — By Professor C. J. KEYSER: Modern theories in geometry, three hours; General theory of assemblages, three hours. — By Professor H. B. MITCHELL: Vector analysis, two hours; Differential equations, two hours. — By Professor EDWARD KASNER: Differential equations and continuous groups, three hours; General introduction to higher mathematics, three hours. — By Dr. G. H. LING: Modern higher algebra, three hours. — By Professor M. I. PUPIN: Theory of the potential function, two hours; Hydrokinetics, two hours; Partial differential equations of physics, two hours; Special problems, two hours. — By Professor A. P. WILLS: Mechanics, two hours; Theory of elasticity, two hours; Electricity and magnetism, electro-magnetic theory of light, two hours; Thermodynamics, two hours.

CORNELL UNIVERSITY. — By Professor L. A. WAIT: Advanced analytic geometry, three hours. — By Professor J. M. MAHON: Theory of potential and spherical harmonics, three hours. — By Professor J. H. TANNER: Theory of equations, two hours; Teachers' course in algebra, two hours. — By Professor J. I. HUTCHINSON: Automorphic functions, three hours. — By Professor V. SNYDER: Algebraic curves, three hours. — By Professor W. B. FITE: Advanced calculus, three hours; Theory of functions of a real variable, two hours. — By Dr. F. R. SHARPE: Theory of electrons, three hours. — By Dr. W. B. CARVER: Projective geometry, three hours. — By Dr. A. RANUM: Differential equations, two hours. — By Dr. D. C. GILLESPIE: Advanced differential equations, two hours. — By Mr. C. F. CRAIG: Theory of probabilities and insurance, two hours. The Oliver mathematical club will meet weekly.

JOHNS HOPKINS UNIVERSITY. — By Professor F. MORLEY: Vector analysis, two hours; Higher geometry, two hours; Seminar, one hour; Classic authors, one hour. — By Dr. A. COHEN: Differential equations, two hours; Elementary theory of functions, two hours; Introduction to differential equations and vector analysis, two hours. — By Dr. A. B. COBLE: Cremona transformations, two hours (first half year); Theory of statistics, two hours (second half year).

UNIVERSITY OF PENNSYLVANIA. — By Professor E. S. CRAWLEY: Solid analytic geometry, two hours; Higher plane curves, three hours. — By Professor G. E. FISHER: Theory of functions of a complex variable, first half year, three hours; Elliptic functions, second half year, three hours. — By Professor I. J. SCHWATT: Definite integrals, three hours. — By Professor G. H. HALLETT: Lie's theory of continuous groups, first half year, three hours; Galois theory of algebraic equations, second half year, three hours. — By Dr. F. H. SAFFORD: Curvilinear coordinates, three hours. — By Dr. O. E. GLENN: Higher algebraic equations, two hours.

At the meeting of the National academy of sciences held in Washington April 16 and 17, Professor A. R. FORSYTH, of Cambridge University, and Professor D. HILBERT, of the University of Göttingen were elected to associate membership.

PROFESSOR J. TANNERY, of the University of Paris, has been elected a member of the Paris academy of sciences.

PROFESSOR A. LOEWY, of the University of Freiburg, has been commissioned to give regular courses in the mathematics of insurance.

PROFESSOR G. DARBOUX has been appointed associate member of the Belgian academy of sciences.

PROFESSOR PH. FURTWÄNGLER, of the agricultural academy at Poppelsdorf has been appointed professor of mathematics at the technical school of Aachen.

PROFESSOR S. GUNDELFINGER, of the technical school at Darmstadt, retired from active service April 1, on account of ill health.

DR. W. LUDWIG, of the technical school at Karlsruhe, has been appointed professor of descriptive geometry at the technical school of Braunschweig.

PROFESSOR E. VON WEBER, of the University of Munich, has been appointed associate professor of mathematics at the University of Würzburg.

PROFESSOR K. WEIGHARDT, of the technical school at Braunschweig, has been appointed professor of mathematics at the technical school of Hanover.

DR. P. KOEBE has been appointed docent in mathematics at the University of Göttingen.

AT McGill University, W. M. EDWARDS, lecturer in mathematics, has been made assistant professor of civil engineering.

PROFESSORS T. S. FISKE and D. E. SMITH, of Columbia University, will be abroad on leave of absence during the academic year 1907-08.

AT the University of Nebraska, Professor A. L. CANDY has been promoted to a full professorship of mathematics and Professor C. C. ENGBERG to a full professorship of applied mathematics.

DR. S. D. TOWNLEY, astronomer in charge of the International Latitude Observatory at Ukiah, California, and lec-

turer in astronomy in the University of California, has been appointed to an assistant professorship in the department of applied mathematics at Stanford University.

DR. G. D. BIRKHOFF has been appointed instructor in mathematics at the University of Wisconsin.

MR. W. M. CARRUTH, of Cornell University, has been appointed assistant professor of mathematics at Hamilton College.

AT the Massachusetts Institute of Technology the following appointments have been made: Dr. E. B. WILSON, of Yale University, associate professor of mathematics; Dr. H. B. PHILLIPS, of the University of Cincinnati, and Mr. N. J. LENNES, of the University of Chicago, instructors in mathematics. Dr. C. L. E. MOORE has been granted a leave of absence and will spend next year studying in Italy and in Germany.

PROFESSOR MANSFIELD MERRIMAN has retired from the professorship of civil engineering at Lehigh University after a record of twenty-eight years' service.

CHARLES H. HINTON, author of several popular works on the fourth dimension and of late an examiner in the Patent Office at Washington, died in that city on April 30, 1907, at the age of 63 years.

DR. A. FUHRMANN, emeritus professor of mathematics at the Dresden polytechnic school, well known for his work on mechanics, died April 30 at the age of 67 years.

PROFESSOR FERDINANDO ASCHIERI, of the University of Pavia, died April 14 at the age of 60 years.

THE death has recently been announced at the age of 91 years of Professor M. Steinschneider, of Berlin, one of the best authorities on the history of Hebrew mathematics. Professor Steinschneider published numerous works on Hebrew and Hebrew-Arabic literature, including catalogues of the Hebrew manuscripts in various large libraries.

CATALOGUES of second-hand mathematical works : Gustav Fock, Schlossgasse 7, Leipzig, catalogue No. 300, 3,255 titles in mathematics and natural science ; K. F. Kohler's Antiquarium, Kurprinzstrasse 6, Leipzig, catalogue No. 569, periodicals and proceedings of societies, about 2,000 titles ; Martin Boas, Karlstrasse 25, Berlin, N. W., catalogue No. 60, astronomy, mathematics and physics ; H. Lüneburg, Karlstrasse 4, Munich, catalogue No. 73, about 1900 titles in mathematics, astronomy, and physics, including works from the library of the late Professor G. Bauer.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

CAJORI (F.). See CANTOR (M.).

CANTOR (M.). Vorlesungen über Geschichte der Mathematik. Herausgegeben von M. Cantor, unter Mitwirkung von V. Bobylin, A. von Braunnühl, F. Cajori, u. a. Vol. IV : Von 1759-1799. Lieferung 1 : XIX. Abschnitt : S. Günther, Geschichte der Mathematik ; XX. Abschnitt : F. Cajori, Arithmetik, Gleichungslehre, Zahlentheorie. Leipzig, Teubner, 1907. 8vo. 200 pp. M. 5.60

—. Vorlesungen über Geschichte der Mathematik. Band I : Von den ältesten Zeiten bis zum Jahr 1200 nach Christus. 3te Auflage. Leipzig, Teubner, 1907. 8vo. 6 + 941 pp., 1 plate. M. 24.00

DU PASQUIER (L. G.). Zahlentheorie der Tettarionen. (Diss.) Zürich, 1906. 8vo. 75 pp.

FLECHSIG. See LUCZAC.

FORSYTH (A. R.). Theory of differential equations. Part IV : Partial differential equations. 2 vols. Cambridge, 1907. 8vo. Cloth.

GÜNTHER (S.). See CANTOR (M.).

HALBWACHS (M.). Leibniz. Paris, Delaplane, 1906. 18mo. 124 pp. F. 0.90

LAISANT (C. A.). La mathématique. Philosophie. Enseignement. 2e édition, revue et corrigée. Paris, Gauthier-Villars, 1907. 8vo. 7 + 244 pp. Boards. F. 5.00

LARMOR (J.). See STOKES (G. G.).

MARC (L.). Aufgaben aus der höheren Mathematik, technischen Mechanik und darstellenden Geometrie, welche bei der Vorprüfung für Bau-, Maschinen-, Elektro-, Kultur- und Vermessungs-Ingenieure sowie Architekten an der k. technischen Hochschule zu München vom Jahr 1901 ab gestellt worden sind. München, Lachner, 1907. 8vo. 48 pp. M. 2.00