

originated by Noether. The contents of this chapter are due to the author himself. A considerable number of the properties proved in the section have been established by him in previous memoirs. But a new method, that of the inverse system, is here employed for the first time and the results are closely associated with it. The author's own account of the method is to be found on pages 64 ff.

The monograph ends with a note of twelve closely printed pages containing a brief explanation of the theory of ideals of algebraic numbers and functions and of the relation in which the algebraic theory of modular systems stands with respect to it.

Throughout the tract the exposition is given in condensed form, evidently best adapted to the needs of investigators in the field. But a portion of the treatment, especially that of the first two sections, is suited to the needs of the general mathematical reader interested in the general aspects of the theory of algebraic equations in several unknown quantities.

R. D. CARMICHAEL.

NOTES.

THE regular meeting of the Chicago Section of the American Mathematical Society at the University of Chicago on Friday and Saturday, April 4-5, 1919, will include a symposium on the geometry of numbers with applications to questions of minima and algebraic numbers. Formal papers, based largely on the work of Minkowski, will be presented by Professor H. F. Blichfeldt, of Stanford University, and Professor L. E. Dickson, of the University of Chicago. Synopses of these papers will be sent out with the programmes of the meeting.

THE programme of the regular meeting of the Society in New York City on April 26, 1919, will include reports of the work of members of the Society in the government Ordnance Department at Washington and Aberdeen.

THE opening (January) number of volume 20 of the *Transactions of the American Mathematical Society* contains the following papers: "Necessary conditions in the problems of

Mayer in the calculus of variations," by GILLIE A. LAREW; "Linear equations with unsymmetric systems of coefficients," by ANNA J. PELL; "On convex functions," by HENRY BLUMBERG; "Projective transformations in function space," by L. L. DINES; "On the order of primitive groups (IV)," by W. A. MANNING.

There is a portrait of the late Professor MAXIME BÔCHER as frontispiece, with a short obituary note. Copies of this portrait may be obtained by sending twenty cents in postage stamps to the office of the Society, 501 West 116th Street, New York City.

THE opening (January) number of volume 41 of the *American Journal of Mathematics* contains the following papers: "Groups generated by two operators whose relative transforms are equal to each other," by G. A. MILLER; "A classification of general (2, 3) point correspondences between two planes," by T. R. HOLLCROFT; "The classification of plane involutions of order (3)," by ANNA M. HOWE; "On surfaces containing a system of cubics that do not constitute a pencil," by C. H. SISAM; "An isoperimetric problem with variable end-points," by A. S. MERRILL.

WITH the January, 1919, issue, the *Tôkyô Sûgaku-Buturigakkwai Kizi* (*Proceedings of the Tokyo mathematico-physical Society*) begins its third series. The name of the periodical changes with the new series to *Nippon Sûgaku-Buturigakkwai Kizi* (*Proceedings of the physico-mathematical Society of Japan*).

THE January number of the *American Mathematical Monthly* contains the names and rank of one hundred and seventy-eight teachers of mathematics in the national war service.

AT the recent annual meeting of the Mathematical Association of America Professor H. E. SLAUGHT was elected president and Professors R. G. D. RICHARDSON and H. L. RIETZ vice-presidents.

AT the meeting of the London mathematical society held December 12, the following papers were read: By G. H. HARDY and J. E. LITTLEWOOD, "Applications of the method of Faray dissection in the analytic theory of numbers: (1) A new solu-

tion of Waring's problem; (2) Proof that every large number is the sum of at most thirty-three biquadrates; (3) The Riemann hypothesis and the expression of a number as the sum of a stated number of primes"; by N. M. SHAH and B. M. WILSON, "Numerical data connected with Goldbach's theorem"; by M. FRÉCHET, "Integrals in abstract fields."

At the meeting of the Edinburgh mathematical society on January 10, the following papers were read: By E. M. HORSBURGH, "A mechanical solution of a differential equation of torsion"; by F. BOWMAN, "Note on the intersection of a plane curve and its Hessian at a multiple point" and "Note on the formula for the radius of the circumsphere of a tetrahedron in terms of the edges."

THE Prince Jablonowski Society of Leipzig announces the following prize problem for 1921: "To extend the theory of linear functional differential equations in any direction. A complete treatment of new special cases is especially desirable." Competing memoirs should be submitted not later than October 31, 1920. The value of the prize is 1500 marks.

THE philosophical faculty of the University of Berlin announces the following prize problem: "To determine, by means of the theory of elementary divisors, the criteria that a given matrix be capable of representation as the composition of two skew-symmetric matrices." Competing memoirs should be presented before June 4, 1919.

THE academy of sciences of Heidelberg has joined the other learned societies as contributing member to the support of the *Encyklopädie der mathematischen Wissenschaften*.

COLLÈGE DE FRANCE. THE following courses in mathematics are announced for the session beginning December 2, 1918: By Professor G. HUMBERT: Theory of quadratic numbers, two hours.—By Professor J. HADAMARD: Influence of the form of the domain in the problems of mathematical physics, two hours.—By Professor M. BRILLOUIN: English and American theories of the gravitational stability of the earth, two hours.—By Professor L. LANGEVIN: The principle of relativity and the theories of gravitation, two hours.—By Pro-

fessor LE ROY: The present state of mathematical philosophy, and its relations with the philosophy of intuition, two hours.

PROFESSOR M. FRÉCHET, of the Sorbonne, has been appointed professor of mathematics in the reconstituted University of Strassbourg. During the summer semester of the present year (April 15–July 30) he will lecture on General Analysis (Calcul fonctionnel). The lectures will be in French, but Professor Fréchet offers to discuss them in English with any English-speaking students who wish to avail themselves of the opportunity.

THE University of Frankfort has conferred an honorary doctorate on Professor L. KÖNIGSBERGER, of the University of Heidelberg.

DR. V. GEILEN has been appointed docent in mathematics at the University of Münster.

PROFESSOR OTTO STAUDE, of the University of Rostock, has been chosen rector for the year 1918–19.

DR. V. GRILLIER, of the University of Biel, has been appointed professor of mathematics at the University of Bern.

PROFESSOR M. NOETHER, of the University of Erlangen, has retired from active teaching, after forty-six years of service.

THE Royal Society of London has awarded its Copley medal to Professor H. A. LORENTZ, of the University of Leyden, for his work in mathematical physics.

PROFESSOR W. FOORD-KELCEY, of the Royal military academy, has been appointed Officer of the Order of the British Empire, for services in connection with the war.

THE Rumford Committee of the American Academy of Arts and Sciences has voted the sum of \$500.00 to Professor A. G. WEBSTER, of Clark University, in aid of his researches in pyrodynamics and practical interior ballistics.

THE committee recently organized to establish a suitable memorial of the late Professor MAXIME BÔCHER requests that

subscriptions to the memorial fund be sent to the treasurer of the committee, Professor J. H. TANNER, Cornell University, Ithaca, N. Y. Contributors are invited to express their views and wishes in regard to the use which should be made of the fund.

At the University of Manitoba, Dr. H. R. KINGSTON has been promoted to an assistant professorship of mathematics. Assistant professor L. A. H. WARREN has been appointed acting professor of mathematics and astronomy, in the absence of Professor N. B. MACLEAN, who is major in the Canadian artillery service in France.

PROFESSOR E. R. HEDRICK, of the University of Missouri, has recently sailed for France, where he is to take charge of the mathematical work for American soldiers in the Y. M. C. A. system.

DR. L. R. FORD and Mr. R. S. TUCKER have been appointed instructors in mathematics at Harvard University.

At Cornell University, Mr. P. A. FRALEIGH, who was stationed at Aberdeen proving ground, has returned to his instructorship in mathematics. Mr. H. L. SMITH, who was under Major F. R. MOULTON in Washington, and Mrs. HELEN B. OWENS have been appointed instructors in mathematics.

MR. L. E. ARMSTRONG, of Stevens Institute of Technology, has been promoted to an assistant professorship of mathematics.

MR. J. W. BALDWIN, of Michigan State Normal College, has been appointed instructor in mathematics in Detroit Junior College.

PROFESSOR D. A. ROTHROCK, of Indiana University, was recently elected a member of the State Legislature. He is relieved of duties at the University during the legislative session to begin in January.

MR. F. S. NOWLAN, of Bowdoin College, has been promoted to an assistant professorship of mathematics.

AT Brown University, Mr. T. A. CORNELL and Mr. W. R. BURWELL have been appointed instructors and Dr. A. B. FRIZELL lecturer in mathematics. Mr. C. R. ADAMS has resigned his instructorship to accept the Grand Army fellowship.

DR. TOBIAS DANTZIG and DR. G. A. PFEIFFER have been appointed instructors in mathematics at Columbia University.

AT the University of Minnesota, Dr. C. H. YEATON has been appointed instructor in mathematics. Professor G. N. BAUER is on leave of absence, and Professor H. L. SLOBIN has resigned.

MR. R. M. MATHEWS, of the Junior College, Riverside, Cal., has resigned to enter secondary teaching.

MR. ARTHUR RAMSEY, of Grove City College, has been promoted to an assistant professorship of mathematics.

AT Northwestern University, the following new instructors in mathematics have been appointed: Miss JESSICA M. YOUNG, Mr. T. DOLL, Dr. M. G. SMITH, and Mr. P. E. HEMKE.

AT Wesleyan University, Mr. C. L. STEARNS has been appointed instructor in mathematics and assistant in the Van Vleck observatory.

PROFESSOR G. MILHAUD, of the University of Paris, well known for his writings on the history and philosophy of Greek mathematics, died October 1, 1918, at the age of sixty years.

PROFESSOR F. DANIELS, of the University of Fribourg, Switzerland, died November 16, 1918, at the age of fifty-eight years.

PROFESSOR ULISSE DINI, of the R. Scuole Normale Superiore of Pisa, and editor of the *Annali di Matematica*, died October 28, 1918, at the age of seventy-three years.

PROFESSOR L. M. SYLOW, of the University of Christiania, died September 7, 1918, at the age of eighty-five years.

PROFESSOR E. LAMPE, of the technical school at Berlin, died September 4, 1918, at the age of seventy-eight years. He was an editor of the *Jahrbuch über die Fortschritte der Mathematik* and of the *Archiv der Mathematik und Physik*.

PROFESSOR P. VON SCHAEWEN died April 28, 1918, at the age of seventy-one years.

The death is announced of Commander A. N. SKINNER, U. S. N., retired, professor of mathematics at the U. S. Naval Academy from 1898 to 1907.

DR. PAUL CARUS, for many years editor of the *Monist* and the *Open Court*, died at La Salle, Ill., on February 11, 1919.

DR. G. M. GREEN, of Harvard University, author of numerous memoirs in projective differential geometry, died January 24, 1919, at the age of twenty-seven years. He had been a member of the American Mathematical Society since 1913.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

- BIEBERBACH (L.). Differentialrechnung. Leitfäden für den mathematischen und technischen Hochschulunterricht. Leipzig, Teubner, 1917. M. 2.80
- BRENDEL (M.). See GALLE (A.).
- CARATHÉODORY (C.). Vorlesungen über reelle Funktionen. Leipzig, Teubner, 1918. M. 30.00
- DIECK (W.). Nichteuklidische Geometrie in der Kugelebene. (Mathematisch-physikalische Bibliothek, Band 31.) Leipzig, Teubner, 1918. M. 1.00
- FRICK (H.). Ueber den Zusammenhang der Perioden quadratischer Formen positiver Determinante mit der Zerlegung einer Zahl in die Summe zweier Quadrate. (Diss., Eidgenöss. Technische Hochschule.) Zürich, 1918.
- GALLE (A.) und STÄCKEL (P.). Materialien für eine wissenschaftliche Biographie von Gauss. Gesammelt von F. Klein, M. Brendel, und L. Schlesinger. Heft 4: C. F. Gauss als Zahlenrechner von A. Galle; Heft 5: C. F. Gauss als Geometer von P. Stäckel. Leipzig, Teubner, 1918. Gr. 8vo. 142 pp. M. 5.60
- KLATT (—). See SCHMIEDEBERG (—).
- KLEIN (F.). See GALLE (A.).