

integrate $y^m/(dy/dx)$ with respect to y (usually in series form) "as an independent variable and as an algebraic function." The result will be the integral of $\varphi^m(x)dx$ expressed in terms of the function itself, whether it be algebraic or transcendental. The formulas derived at this point are of immediate applicability to the quadrature and rectification of, for example, such troublesome curves as the logarithm.

The final section on "the integration of the logarithm of binomials and other complex quantities" is less satisfactory and of less interest than the earlier sections and is made up of various odds and ends.

E. GORDON BILL.

NOTES.

At the meeting of the National Academy of Sciences held at Princeton University November 16-17, 1920, the following mathematical papers were read: By E. B. WILSON: "Equipartition of energy"; by EDWARD KASNER: "Einstein gravitational fields: orbits and light rays"; by J. W. ALEXANDER: "Knots and Riemann spaces"; by PHILIP FRANKLIN: "The map coloring problem."

THE July number (volume 42, number 3) of the *American Journal of Mathematics* contains the following papers: "The failure of the Clifford chain," by W. B. CARVER; "On the representations of numbers as sums of 3, 5, 7, 9, 11 and 13 squares," by E. T. BELL; "On a certain class of rational ruled surfaces," by ARNOLD EMCH.

THE opening (September) number of volume 22 of the *Annals of Mathematics* contains: "On multiform functions defined by differential equations of the first order," by PIERRE BOUTROUX; "Hermitian metrics," by J. L. COOLIDGE; "On the expansion of certain analytic functions in series," by R. D. CARMICHAEL; "Notes on the cyclic quadrilateral," by F. V. MORLEY; "Note on the preceding paper," by F. MORLEY; "Qualitative properties of the ballistic trajectory," by T. H. GRONWALL.

It is announced that because of the greatly increased cost of printing the publication of the *Journal de Mathématiques pures et appliquées*, founded by Liouville in 1836, will be discontinued with the current volume (series 8, volume 1) unless a considerable number of new subscriptions are secured at once. If any American mathematicians or libraries have suspended their subscriptions because of war conditions, they should send in their orders for renewal as soon as possible.

THE following six American doctorates in mathematics should be added to the list published in the November BULLETIN, making a total of twenty-one conferred in 1919-20: H. R. BRAHANA, Princeton: "Curves on surfaces"; H. J. ETTLINGER, Harvard: "I. Existence theorems for the general real self-adjoint linear system of the second order. II. Oscillation theorems for the real self-adjoint linear system of the second order"; E. S. HAMMOND, Princeton: "Periodic conjugate nets of curves"; G. M. ROBISON, Cornell: "Divergent double sequences and series"; BIRD M. TURNER, Bryn Mawr: "Plane cubics with a given quadrangle of inflexions"; W. L. G. WILLIAMS, Chicago: "Fundamental systems of formal modular seminvariants of the binary cubic."

PROFESSOR J. H. TANNER, of Cornell University, and Mrs. TANNER have given to the trustees of that institution fifty thousand dollars to establish a mathematical institute under the following stipulations. The money is to be allowed to accumulate without diversion for seventy-five years. At the end of that time one professor shall be appointed, whose duty it shall be to begin the formulation of plans for the proposed institute. At the end of each of the four succeeding periods of five years one or more additional professorships shall be established, the incumbents to collaborate in the same plans. The stipends of these professors shall be paid from the fund, but no other demands shall be made upon it until one hundred years from the date of the deed of gift (June, 1920), from which time on the income of the entire sum shall be devoted to the maintenance of the institute; half of the expenditure of each year is to be applied to research in the mathematical sciences.

It is announced that a new edition of Professor H. S. CARSLAW'S book on Fourier's series and integrals, published

in 1906 by Macmillan and for some time out of print, is now in press. The book has been completely rewritten and will consist of two volumes, the first dealing with infinite series and integrals, with special reference to Fourier's series and integrals, and the second with the conduction of heat. It is expected that the first volume will appear early in 1921, and the second in the course of that year.

APPLICATIONS for appointment to the two Benjamin Peirce instructorships at Harvard University for the year 1921-22 should reach Professor W. F. OSGOOD on or before February 1, 1921, accompanied by the necessary papers. Each instructor is now required to give two elementary courses and one other course ordinarily of an advanced character, but has no administrative duties. The salary has been increased to \$2000.

THE Paris academy of sciences has awarded its Poncelet prize to Professor ELIE CARTAN, of the University of Paris, and its Francœur prize to Professor RENÉ BAIRE, of the University of Dijon.

THE Italian society of sciences (the XL) has awarded its gold medal for 1920 to Professor A. SIGNORINI, of the University of Palermo, for his papers published during the last five years.

THE new Greek mathematical society, founded in 1918, now numbers about one hundred members.

PROFESSOR ALBERT EINSTEIN, of the University of Berlin, has accepted the chair of science at the University of Leyden. He will divide his time between the two institutions.

PROFESSOR M. DISTELI has been appointed professor of geometry at the University of Zurich.

PROFESSOR F. GONSETH has been appointed professor of mathematics at the University of Bern.

PROFESSOR MICHEL PLANCHEREL, of the University of Freiburg, has been appointed to a professorship at the Zurich technical school, as successor to the late Professor A. HURWITZ.

At the University of Cagliari, Dr. A. COMESSATTI, of the University of Padua, and Dr. M. PICONE, of the University of Catania, have been appointed to associate professorships of mathematics.

Dr. A. PALATINI, of the University of Padua, has been appointed associate professor of rational mechanics at the University of Messina.

Professor G. ARMELLINI, of the University of Padua, has been transferred to a full professorship of celestial mechanics at the University of Pisa.

Professor C. J. DE LA VALLÉE POUSSIN has been elected president of the recently formed Fédération belge des sociétés des sciences mathématiques, physiques, naturelles, médicales et appliquées.

Professor CHARLES RIQUIER, of the University of Caen, has been elected correspondent of the Paris academy of sciences in the section of geometry, as successor to the late Professor H. G. ZEUTHEN, and Professor L. T. QUEVEDE, of the University of Madrid, has been elected correspondent in the section of mechanics, as successor to the late Professor BOULVIN.

In the faculty of sciences of the University of Paris, the following changes have been made. The professorship of the theory of functions has been changed to a professorship of theoretical and celestial physics. Dr. EMILE BOREL, professor of the theory of functions, has been appointed professor of the calculus of probabilities and mathematical physics, as successor to Professor V. J. BOUSSINESQ, who has retired. Dr. PAUL PAINLEVÉ, professor of rational mechanics, has been appointed professor of analytical and celestial mechanics, as successor to Professor PAUL APPELL; Professor ELIE CARTAN succeeds Professor PAINLEVÉ in the chair of rational mechanics, and Professor ERNEST VESSIOT, recently appointed assistant director of the Ecole normale supérieure, succeeds Professor CARTAN in the chair of the differential calculus. Dr. J. DRACH has been appointed professor of general mathematics, and Dr. PAUL MONTEL maître de conférences in mathematics.

PROFESSOR PIERRE BOUTROUX has been appointed professor of the history of sciences at the Collège de France.

PROFESSOR GABRIEL KOENIGS has been elected member of the Conseil supérieure de l'instruction publique, as successor to Professor APPELL.

PROFESSOR M. G. HUMBERT, of the Ecole polytechnique, has retired from active teaching, with the title of honorary professor.

PROFESSOR E. FABRY, of the University of Montpellier, has been appointed professor of integral and differential calculus at the University of Aix-Marseille.

DR. RENÉ GARNIER, of the University of Poitiers, has been promoted to a professorship of theoretical and applied mechanics.

MR. A. E. JOLIFFE, of Corpus Christi College, Oxford, has been appointed professor of mathematics at the Royal Holloway College, London.

LT. COL. A. R. RICHARDSON has been appointed professor of mathematics at University College, Swansea.

PROFESSOR L. E. DICKSON was appointed delegate of the National academy of sciences to attend the conference called by the Royal society of London in September to consider the future of the International catalogue of scientific literature.

AT Colgate University, associate professor A. W. SMITH has been made full professor and head of the department of mathematics as successor to Professor J. M. TAYLOR, who has retired. Professor T. R. AUDE, of the Carnegie Institute of Technology, has been appointed associate professor of mathematics.

PROFESSOR J. K. LAMOND, of Pennsylvania College, Gettysburg, has resigned to accept a position in the engineering department of the Bell Telephone Company at Philadelphia.

At the U. S. Naval Academy, assistant professor G. R. CLEMENTS has been promoted to an associate professorship of mathematics, and Dr. L. S. DEDERICK and Dr. L. T. WILSON to assistant professorships.

At the University of Wyoming, Professor C. B. RIDGAWAY has retired, after twenty-four years of service, and Professor C. E. STROMQUIST succeeds him as head of the department of mathematics. Mr. A. R. FEHN, of the Kansas Agricultural College, has been appointed associate professor of mathematics.

ASSOCIATE professor H. H. CONWELL, of the University of Idaho, has resigned to accept a similar position in the department of mathematics at Beloit College.

DR. LENNIE P. COPELAND and Dr. MARY F. CURTIS have been promoted to assistant professorships of mathematics at Wellesley College.

At the University of North Carolina, Professor WILLIAM CAIN has retired from active teaching, and Professor ARCHIBALD HENDERSON succeeds him as head of the department of mathematics; assistant professors A. W. HOBBS and J. W. LASLEY, JR., have been promoted to associate professorships.

IN the department of mathematics at Purdue University, the following changes have been made: assistant professor W. A. ZEHRING has been promoted to an associate professorship; Mr. C. T. HAZARD, Mr. C. K. ROBBINS, and Dr. G. H. GRAVES have been promoted to assistant professorships; Dr. E. M. BERRY, Mr. W. H. FRAZIER, Mr. W. R. HARDMAN, and Mr. J. A. NEEDY have been appointed instructors.

At the University of Saskatchewan, Dr. I. A. BARNETT, of the University of Illinois, has been appointed assistant professor of mathematics. Dean G. H. LING has been granted leave of absence for the current year, and is at present in England.

PROFESSOR I. L. MILLER, of Carthage College, has been appointed associate professor of mathematics at the South Dakota State College.

ASSISTANT professor HILLEL HALPERIN, of the University of Arkansas, has been appointed to an associate professorship at the Texas Agricultural and Mechanical College.

PROFESSOR J. B. FAUGHT, of the State normal college at Kent, Ohio, has been appointed professor of mathematics at Yankton College.

PROFESSOR P. H. GRAHAM, of Agnes Scott College, has been appointed instructor in mathematics at New York University.

MR. R. M. MATHEWS, of the University of Minnesota, has been appointed assistant professor of mathematics at Wesleyan University.

MR. B. D. ROBERTS has been appointed professor of mathematics at Parsons College, Fairfield, Iowa.

MR. C. D. EHRMAN, of the University of Wisconsin, has been appointed assistant professor of mathematics at Richmond College.

MISS FRANCES B. HATCHER has been appointed associate professor of mathematics at Westhampton College, Richmond, Va.

DR. H. F. MACNEISH has been promoted to an assistant professorship of mathematics at the College of the City of New York.

DR. C. L. E. WOLFE, of the Junior College at Santa Rosa, has been appointed instructor in mathematics at the California Institute of Technology, Pasadena.

PROFESSOR H. W. STAGER, of Fresno Junior College, has been appointed instructor in mathematics at the University of Washington.

AT Harvard University the following instructors in mathematics have been appointed for the current academic year: professor C. A. GARABEDIAN, of New Hampshire College; Mr. R. E. LANGER, Mr. E. L. MACKIE, and Mr. H. LEVY, of

Harvard University; Mr. A. J. COOK, of the University of Alberta.

MRS. M. I. LOGSDON has been appointed associate in mathematics at the University of Chicago.

MISS MARY BALL has been appointed instructor in mathematics at Northwestern University.

DR. TOBIAS DANTZIG, of Johns Hopkins University, has resigned to undertake mathematical research for an engineering company in New York City.

MR. T. H. JOHNSON, Mr. A. S. ADAMS, and Mr. W. L. LUCAS have been appointed instructors in mathematics at the University of Maine.

MR. J. B. ROSENBACH, of the University of Illinois, has been appointed instructor in mathematics at the Carnegie Institute of Technology.

MISS JESSIE M. SHORT, formerly of Carleton College, has been appointed instructor in mathematics at Reed College.

PROFESSOR JOHN PERRY, of the Royal College of Science, London, died August 4, 1920, at the age of seventy years.

PROFESSOR F. A. TARLETON, of Trinity College, Dublin, died June 20, 1920, at the age of seventy-nine years.

THE death is reported, in August, 1920, of assistant professor H. D. FRARY, of the University of Wisconsin.

PROFESSOR SAMUEL HANAWAY, who retired in 1916 on account of ill health from the department of mathematics of the College of the City of New York, died recently at the age of sixty-six years.

PROFESSOR E. W. STANTON, of the teaching staff of Iowa State College since 1870, died September 12, 1920, at the age of seventy years.

PROFESSOR MAELYNETTE ALDRICH, of Martha Washington College, died February 22, 1920.

BOOK CATALOGUES:—Librairie scientifique Emile Blanchard, Paris, Catalogue of works on mathematics, astronomy, meteorology, and navigation, 1200 titles.—Galloway and Porter, Cambridge, List of 116 titles in mathematics and physics.—Gauthier-Villars, Paris, Bulletin trimestriel, 2e trimestre, 1920.—Macmillan, New York, Catalogue of books on mathematics, astronomy, and navigation, 1920–1921.—Bücher, Musikalien, Lehrmittel, Kunstblätter, ein Verzeichnis herausgegeben von 65 deutschen Verlegern, Leipzig, 1920.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

- ALEXANDER (S.). Space, time, and deity. 2 volumes. London, Macmillan, 1920. 16 + 347 + 13 + 437 pp. 36s.
- BADUREAU (A.). Causeries philosophiques. Paris, Gauthier-Villars, 1920. 8vo. 20 + 226 pp. Fr. 12.00
- BOREL (E.). See GIRAUD (G.).
- BRODETSKY (S.). A first course in nomography. London, Bell, 1920. Demy 8vo. 10s.
- BROGGI (U.). Análisis matemático. Volumen 1: Las nociones fundamentales. La Plata, Facultad de ciencias físicas, matemáticas y astronómicas, 1919. Royal 8vo. 152 pp. 6 pes.
- BROUWER (L. E. J.). Wiskunde, waarheid, werkelijkheid. Groningen, Noordhoff, 1919. 29 pp.
- GIRAUD (G.). Leçons sur les fonctions automorphes. Fonctions automorphes de n variables. Fonctions de Poincaré. (Collection de monographies sur la théorie des fonctions publiée sous la direction de M. Emile Borel.) Paris, Gauthier-Villars, 1920. 8vo. 4 + 128 pp. Fr. 13.00
- HALSTED (G. B.). See SACCHERI (G.).
- HARTINGER (H.). Ueber Komplexe, die sich erzeugen durch Kongruenzen 1ter Ordnung, 2ter Klasse, deren Brennpunkte auf einer Kegelfläche 2ten Grades liegen. (Dissertation.) Technische Hochschule, München, 1916.
- MANGOLDT (H. von). Einführung in die höhere Mathematik für Studierende und zum Selbstunterricht. 2ter Band. 2te Auflage. Leipzig, 1919. M. 26.00
- SACCHERI (G.). Euclides vindicatus; translated with introduction and notes by G. B. Halsted in a Latin-English edition. Chicago, Open Court, 1920. 8vo. 280 pp. \$2.00