

The treatment of topics is informal and inductive, there being a noticeable absence of formal proofs. Naturally the reviewer does not agree with the arrangement of material nor with its content, but we do agree with an avowed object of the book, namely that of coaxing students in a small college, or elsewhere for that matter, into a further study of non-required mathematics. We object to the form of the discussion of the quadratic in one unknown (pages 46, 47) wherein the authors seem to discard complex roots, as *roots*. Of course problems in analytic geometry and elsewhere lead to equations with complex roots, which are not interpretable in terms of the real elements presented in the problem. But this does not seem to be the meaning of the authors.

C. F. CRAIG.

NOTES.

THE following mathematical papers have appeared in recent numbers of the *Proceedings of the National Academy of Sciences*: volume 5, number 1 (January, 1919): "A theorem in power series, with an application to conformal mapping," by T. H. GRONWALL; number 3 (March): "Tables of the zonal spherical harmonic of the second kind $Q_1(z)$ and $Q_1'(z)$," by A. G. WEBSTER and W. FISHER; number 4 (April): "On the real folds of abelian varieties," by S. LEFSCHETZ; "Covariants of binary modular groups," by O. E. GLENN; "The general solution of the indeterminate equation: $Ax + By + Cz + \dots = r$," by D. N. LEHMER; number 6 (June): "On the most general class L of Fréchet in which the Heine-Borel-Lebesgue theorem holds true," by R. L. MOORE; "On a certain class of rational ruled surfaces," by A. EMCH; number 7 (July): "On the twist in conformal mapping," by T. H. GRONWALL; "Groups involving only two operators which are squares," by G. A. MILLER; "Real hypersurfaces contained in abelian varieties," by S. LEFSCHETZ.

THE concluding (June) number of volume 20 of the *Annals of Mathematics* contains the following papers: "Relations between abstract group properties and substitution groups," by G. A. MILLER; "The complete quadrilateral," by J. W.

CLAWSON; "Triply conjugate systems with equal point invariants," by L. P. EISENHART; "On a system of linear partial differential equations of the hyperbolic type," by T. H. GRONWALL; "Some properties of circles and related conics," by J. H. WEAVER; "Integrals in an infinite number of dimensions," by P. J. DANIELL; "On the differentiability of the solution of a differential equation with respect to a parameter," by J. F. RITT; "Note on the derivatives with respect to a parameter of the solutions of a system of differential equations," by T. H. GRONWALL; "On quaternions and their generalization and the history of the eight-square theorem. Addenda," by L. E. DICKSON.

The July number (volume 41, number 3) of the *American Journal of Mathematics* contains the following papers: "Invariants of differential geometry by the use of vector forms," by C. D. RICE; "On certain saltus equations," by HENRY BLUMBERG; "Investigations on the plane quartic," by TERESA COHEN; "On surfaces containing two pencils of cubic curves," by C. H. SISAM; "Modular invariants of a quadratic form for a prime power modulus," by J. E. MCATEE.

ON November 2, 1918, the Norwegian mathematical society was founded at Christiania. Its officers are Professors STÖRMER, president, BIRKELAND, vice-president, PALMSTRÖM, secretary, and SOLBERG, treasurer. The Society will publish a *Bulletin*, under the editorship of Professors Alexander and Heegaard.

THE firm of Julius Springer Berlin, announces the publication of a new journal devoted exclusively to original mathematical memoirs, the *Mathematische Zeitschrift*. It is edited by Professor L. Lichtenstein, with the collaboration of Professors K. Knopp, E. Schmidt, and I. Schur and an editorial committee consisting of Professors W. Blaschke, L. Féjer, C. Herglotz, A. Kneser, E. Landau, O. Perron, F. Schur, E. Study and H. Weyl. Two volumes appear annually.

ON December 12, 1918, Professor FELIX KLEIN celebrated the fiftieth anniversary of his doctorate, and on April 25, 1919, his seventieth birthday.

PROFESSOR C. KOSTKA, of Insterburg, Dr. W. LIETZMANN, of

Jena, Professor H. E. TIMERDING, of the Braunschweig technical school, and Professor W. LOREY, of Leipzig, have been elected members of the Leopoldinisch-Carolinische Akademie der Naturforscher, of Halle.

PROFESSOR E. GRÜNEISEN has been appointed associate professor of mathematical physics at the University of Marburg.

PROFESSOR G. HESSENBERG, of the Breslau technical school, has been made Geheimer Regierungsrat.

PROFESSOR ERHARD SCHMIDT, of the University of Berlin, has been elected a member of the mathematico-physical class of the academy of sciences of Berlin.

DR. A. TIMPE, of the University of Münster, has been appointed professor of mathematics at the agricultural school of Berlin.

PROFESSOR N. E. NÖRLUND, of the University of Lund, has been appointed professor of mathematics at the University of Copenhagen.

PROFESSORS W. FEUSSNER, of the University of Marburg, and G. FREGE, of the University of Jena, have retired from active teaching.

DR. E. JACOBSTHAL, of the Berlin technical school, has been promoted to a professorship of mathematics.

PROFESSOR H. VON MANGOLDT has been elected president of the Deutsche Mathematiker-Vereinigung for 1918-19. Professor FELIX KLEIN has been elected honorary president for the same period, in honor of the fiftieth anniversary of his doctorate.

PROFESSOR H. FEHR, of the University of Geneva, has been elected foreign correspondent of the Royal society of sciences of Liège.

DR. A. MOHRMANN has been appointed professor of mathematics at the University of Basle.

PROFESSOR P. APPELL has retired from the office of dean of the faculty of sciences of the University of Paris, after sixteen years of service.

PROFESSOR H. ANDOYER, of the Sorbonne, has been elected member of the Paris academy of sciences, in the section of astronomy.

DR. H. LEBESGUE, of the University of Paris, has been promoted to a professorship of the application of analysis to geometry. Professor Lebesgue has been elected president of the Société mathématique de France for the year 1919.

DR. E. VESSIOT has been appointed professor of general mathematics at the University of Paris, as successor to Professor C. GUICHARD, who has been transferred to a professorship of higher geometry.

DR. J. CHAZY has been appointed professor of mathematics at the University of Lille, as successor to the late Professor J. CLAIRIN.

DR. P. HUMBERT has been appointed maître de conférences at the University of Montpellier, during the absence of Dr. A. DENJOY, who is at the University of Utrecht.

DR. L. ROY has been appointed professor of analytical mechanics at the University of Toulouse, as successor to the late Professor S. LATTÈS.

DR. H. R. HASSÉ, of the University of Manchester, has been appointed professor of mathematics at the University of Bristol.

At the May meeting of the American academy of arts and sciences, Professors JOSEPH LIPKA, G. A. MILLER, F. R. MOULTON, and VIRGIL SNYDER were elected fellows in the section of mathematics and astronomy.

MAJOR E. V. HUNTINGTON, who has been assigned to statistical duty in Washington, D. C., during the past year, was recently made a member of the General Staff. He is returning to Harvard University in the autumn.

DR. HENRY BLUMBERG, of the University of Illinois, has been promoted to an assistant professorship of mathematics.

ASSISTANT professor W. W. RANKIN, of the University of North Carolina, has been granted leave of absence for the year 1919-20 and has been appointed instructor in mathematics at Columbia University for that period.

PROFESSOR M. E. GRABER, of Heidelberg University, Tiffin, Ohio, has been appointed professor of physics at Morningside College, Sioux City, Iowa.

ASSISTANT professor M. O. TRIPP, of the University of Maine, has been promoted to an associate professorship of mathematics.

PROFESSOR W. GROSS, of the University of Vienna, died October 29, 1918, at the age of thirty-two years.

THE death is reported of Dr. J. KELLER, of the technical school at Zürich.

PROFESSOR C. BRANDENBERGER, of the cantonal school at Zürich, died January 2, 1919.

PROFESSOR PAUL MANSION, of the University of Ghent, died April 18, 1919, at the age of seventy-five years.

PROFESSOR C. ALASIA DE QUESADA, of the gymnasium at Albengo, died November 19, 1918, at the age of forty-nine years.

PROFESSOR EMILE DUMONT, of the Institut Michot-Montgenast at Brussels, was killed in action in the late war.

THE Rt. Hon. JOHN WILLIAM STRUTT, Lord Rayleigh, died July 1, 1919, at the age of seventy-six years.