VOLUME II OF LORIA'S HISTORY

Storia delle Matematiche. By Gino Loria. Volume II. *I Secoli XVI e XVII.* Torino, 1931. 595 pp.

The second volume of Loria's History of Mathematics fulfills the expectations that the excellent first volume aroused.* We have here an account of the early development of modern mathematics, told in an interesting and often illuminating manner, and making full use of the extensive knowledge of the whole field for which Professor Loria is so well known. The book covers the two epoch-making centuries, the sixteenth and seventeenth, extensively and thoroughly. Even a beginner, reading through these stirring narrations, can not fail to be thrilled with the sense of the tingling vitality of those times, and the deep significance of their discoveries for all the long future; while the scholar will admire the aptness with which the work of a man or a period is characterized, and will appreciate, even where he does not always agree with, the originality and vivacity of the author's discussion.

A good idea of the plan and arrangement of the book can be obtained by noting the chapter groupings. They are as follows: Chapter 16, 64 pages on "syncopated algebra"† in Italy (dealing especially with Tartaglia, Cardan, Ferrari, and Bombelli); Chapter 17, 42 pages on syncopated algebra in Europe "Beyond the Alps," with Vieta as the most important name, but giving adequate attention also to Stifel, Recorde, Stevin, and others; Chapter 18, 27 pages on the influence of Humanism on mathematical studies; Chapter 19, 28 pages on trigonometry in the sixteenth century, including an interesting discussion of the quadrature of the circle; Chapter 20, 11 pages on scientific periodicals and societies founded during the seventeenth century; Chapter 21, 36 pages on the "first years of a glorious century," devoted particularly to Napier, Galileo, and Kepler; Chapter 22, 30 pages on the disciples of Galileo, especially Cavalieri and Torricelli; Chapter 23, 23 pages giving accounts of Girard, Harriot, Oughtred, and Hérigone; Chapter 24, 65 pages devoted to Descartes and Fermat; Chapter 25, 33 pages on the revival of pure geometry (the Italian word "Risveglio" in this connection cannot be adequately reproduced in English), the leaders in the movement being of course Desargues and Pascal; Chapter 26, 27 pages devoted to Roberval, Wallis, Barrow, and other immediate precursors of Newton and Leibniz in laying the foundations of the calculus; Chapter 27, called "Intermezzo," 41 pages on miscellaneous geometric discoveries, with Huygens as the most important figure; Chapter 28, 53 pages equally divided between Newton and Leibniz, discussing not only the calculus but also other phases of their mathematical work; Chapter 29, 33 pages on the disciples of Newton and Leibniz, the greatest names being Jacques and Jean

* The first volume was reviewed in this Bulletin, vol. 36 (1930), pp. 336–337.

† This term is explained in Cajori's *History of Mathematics*, New York, 1919, p. 111.

Bernoulli; and Chapter 30, 18 pages on the priority strife between Newton and Leibniz.

With this choice and distribution of material there can not well be any considerable disagreement, as the most important developments, their mutual interactions, and the personalities of the workers, are adequately discussed. The present reviewer would however have preferred that considerably less space—best of all, none at all—should have been given to the quarrels about the solution of the cubic equation, the properties of the cycloid (as to whether Torricelli plagiarized from Roberval and Galileo or not—his complete integrity is now universally acknowledged), and especially the most unfortunate Newton-Leibniz affair. Is it not better that such unprofitable topics be buried in oblivion as speedily as possible? The many pages that would thus be gained might be given to an amplification of many of the topics which now for want of space are rather inadequately treated. For example, Napier's invention of logarithms, Pascal's theorems on the conics, Kepler's and Wallis's methods of "integration," Barrow's ingenious results derived from his "differential triangle," and Newton's studies in algebra and in infinite series. Also, the six pages on "Works of Desargues" could better have given more details of his discoveries than so much about the writings of minor authors who attacked or defended Desargues.

That the style is vivid and picturesque will not need to be mentioned to any one who has read other writings of Professor Loria. If this quality could be recaptured in a translation, it would add a volume of unique value to the small number of excellent histories of mathematics in English.

One detail is somewhat disturbing, that is, the "translation" into Italian of the given names of non-Italian scientists. Such combinations as Biagio Pascal, Isacco Newton, Goffredo Guglielmo Leibniz, to mention only the best known of the names thus treated, seem in inferior taste to the orthography used by the men in question themselves. (Curiously, Lord Brouncker—by oversight?—appears (p. 354) as "William Brouncker.") Misprints, while apparently less numerous than in the first volume, are disturbingly evident, especially in the bibliographies. With few exceptions, however, they are not such as to cause any difficulty to a reader. The date of Desargues's death is 1662, not 1661 (p. 368); and on page 564 there is a reference to "Ostwald's Klassiker der exacten Gesellschaften"! Wallis's "Treatise of Algebra . . . " was published in English in 1685, in Latin in 1693, instead of the dates given on page 463. An index of subjects, to supplement the index of names, would have been a valuable addition.

The appearance of the announced third volume will be awaited with eager anticipation by all who are interested in the history of mathematics.

R. B. McCLENON