

*Histoire des Mathématiques dans l'Antiquité et le Moyen Age.*  
H. G. ZEUTHEN. Edition Française, revue et corrigée par  
l'auteur, traduite par JEAN MASCART. Paris, Gauthier-  
Villars, 1902. Pp. xvi + 296.

THIS work originally appeared in Danish in 1893. Two years later a German translation was published, thus bringing it quite generally before the mathematical world. It is a compliment to the excellence of the work that now a French edition should make it known to those who confine their studies to the Latin tongues. Furthermore it is a fortunate circumstance that Professor Paul Tannery has taken such interest in the translation as to examine the manuscript and append a number of valuable notes. Among these notes is the record of the comparatively recent discovery of the Metrics of Heron.

The size of the work is some evidence of its nature. It makes no pretense to set forth original discoveries. It claims merely to digest the important facts as presented by the works of Cantor, Hankel, Chasles and others of their class. These facts it seeks to place in relief, neglecting as unessential to the purpose in view the minor details, the question of the discovery of various theorems, and the controversies over dates and incidents of biography. The result is a manual whose usefulness is not limited merely to the needs of teachers of mathematics in Denmark, for whom it was written, and who, by a wise regulation of the government, are required to pass an examination upon the history of the subject.

The work is confined in large measure to the history of Greek mathematics, about three fourths of the space being thus employed. Less than ten per cent of the space is given to Hindu mathematics, and about fifteen per cent to the middle ages, including the work of the Arabs. This allotment is probably a fair one in the present state of our knowledge, and is certainly one to be expected from a man who has done so much in the study of Greek mathematics. Suter's recent investigation of the mathematical literature of the Arabs, and Braunnmühl's exposition of their contributions to trigonometry, are, however, likely to change the common estimate that they were merely transmitters of knowledge, and to give them more prominence in future works.

For so brief a sketch, the work is to be commended for its attempt in several instances to bring out causal relations and to evaluate the work of prominent writers. This is

best shown in the discussion of the state of mathematics before Euclid, and of the Elements of this writer. The weakness of the definitions and postulates as set forth in this classic work are treated in such a way as to furnish abundant material for thought on the part of the champions of Euclid as a text-book writer. The note which follows this discussion, *Sur les hypothèses de la géométrie* (Anmerkung über die Voraussetzungen der Geometrie), is a good résumé of the question of non-euclidean geometry.

The work is suggestive in its references to the connection between the ancient and modern mathematics. This appears in the discussions of the quadratures of Archimedes and their relation to the integral calculus. In view of the author's high appreciation of the fifth book of Euclid, it is a little strange that the relation of this to the modern theory of irrationals is not mentioned.

Since the work is merely a sketch, it would be unfair to enter upon any extended criticism of details, although there is frequently a temptation to do so. This temptation is particularly strong where the author's statement is true and yet conveys a false impression. Thus after speaking of Widman's arithmetic (or Widmann's, as the name appears here, and usually in later works), he says: "Dès 1483, d'autre part, avait été imprimée *l'Arithmétique dite de Bamberg*." This is true, but it conveys the impression that this was the first printed arithmetic, at least in Germany, when it was neither the first nor the first German one to appear. The title of Widman's book looks odd in French translation, *Calcul adroit et joli pour tout commerce*; but the German title looks still more peculiar, since it is neither the original, *Behend und hüpsch Rechnung vff allen Kaufmanschaften* (1508 edition, the others varying slightly), nor the modern form. The statement is made that the symbols + and - are used in this work, a true but a misleading one. It is true that Widman says (edition of 1508, fol. 59v.), "Was - ist das ist minus \* \* \* vnd das + das ist mer," but he uses the symbols not to express operations but to indicate excess or deficiency, as 4 cwt. + 5 lbs., 4 cwt. - 17 lbs. A similarly misleading statement is made in connection with Fibonacci, who, it is said, "est originaire de Pise, importante ville commerciale, où, de bonne heure, il apprit le calcul sur l'abaque." As a matter of fact the evidence is in favor of his having learned number and the abacus at Bougie, where his father was a factor, a point of much interest in the history of his *Liber abaci*.

The salient features of the work are, however, commendable, and it is hoped that its publication in France may awaken new interest in a phase of the subject in which that country at one time excelled all others.

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### NOTES.

THE Ninth Summer Meeting of the AMERICAN MATHEMATICAL SOCIETY will be held at Northwestern University, Evanston, Ill., in the first week of September. A preliminary circular in regard to the meeting will be issued about May 20th.

THE first meeting of the Pacific Section of the AMERICAN MATHEMATICAL SOCIETY was held at San Francisco, May 3. A report of the meeting will appear in a later number of the BULLETIN.

THE Librarian acknowledges the gift to the AMERICAN MATHEMATICAL SOCIETY of six volumes of mathematical works presented by M. C. Naud, Paris, and one volume by Delalain Frères, Paris.

THE seventy-fourth general meeting of the Gesellschaft Deutscher Naturforscher und Aerzte will be held at Karlsruhe, September 21-27. Section I includes mathematics, astronomy and geodesy; section III, applied mathematics and physics.

THE twenty-third general meeting of the Deutscher Geometer-Verein will be held at Düsseldorf, July 20-23.

THE annual stated meeting of the National Academy of Sciences was held at Washington, D. C., April 15-17. Among the papers presented was one on "The postulates of geometry," by Mr. C. S. PEIRCE.

THE second (April) number of volume 24 of the *American Journal of Mathematics* contains the following articles: "Canonical form of a linear homogeneous transformation in an arbitrary realm of rationality," by L. E. DICKSON; "A new theory of collineations and their Lie groups," by