Il Passato ed il Presente della Principali Teorie geometriche. 
Teresa Edizione accresciuta di uno Squared allo Sviluppo della 
Geometria in quest'ultima Decennio. By Gino Loria. 
Turin, C. Clausen, 1907. xxiii + 475 pp.

Loria's well known history of modern geometrical theories originally appeared serially in the Memorie della R. Accademia 
delle Scienze di Torino. Ten years later, in 1896, a second edition 
was published in book form, and a German translation by 
Sturm made the work more accessible. The present third edition, a volume of almost five hundred pages, is especially 
valuable on account of the appended sketch of the development 
of geometry during the last decade, which occupies over a hun­
dred pages.

The first chapter of the book gives a rapid survey of the 
origin and development of geometry up to the middle of the 
nineteenth century. (An English translation by Halsted ap­
peared in the Monist for October, 1902.) Then follow separate chapters on the principal modern theories: plane algebraic 
curves, algebraic surfaces, twisted curves, differential geometry, 
analysis situs and configurations, line geometry, correspondences 
and transformations, enumerative geometry, non-euclidean 
geometry, hyperspaces. The final chapter is devoted to mis­
cellaneous topics ranging from kinematical and constructive 
geometry to quaternions and vector analysis.

The appendix is divided into sections numbered and named in accordance with the chapters enumerated above. After a 
few introductory paragraphs on each topic, most of the space is devoted to the bibliographies. In some cases these extend up to 1907, in others only to 1904. Of course no attempt is made to give complete lists. In the entire work, estimating from the excellent index, references are given to perhaps 5,000 memoirs by 1,500 authors. Considerable space is saved by giving in each case only the number of the volume and the date of publication, without the page numbers.

In a bibliographical work of this kind more energy might have been devoted to the proofreading; the misspelling of proper names is somewhat annoying. Fortunately hardly any of the errors are likely to mislead the reader.

It is interesting to compare the material gathered under the title non-euclidean geometry in the appendix with the corresponding chapter devoted to the literature up to 1897. The latter deals exclusively with the elliptic and hyperbolic geom-
etries; the former with general axiomatic foundations. The activity of investigation in hyperspace geometry, especially in Italy, is put in concrete evidence by the fact that the section devoted to this subject is the longest in the appendix.

E. Kasner.


In the preface we are told that the present work aims to be a reliable guide through the mathematical literature for all those who may seek self-instruction in any domain of the science. It seems especially suited for those students who desire to complete their lecture notes by means of references to the literature and the history of the subject. In view of the size and the scope of the work it is evident that the specialist will, in general, make little use of it along the line of his specialty, but he will find in it much general information in a convenient form. It has been made generally and permanently accessible by its appearance in the _Abhandlungen zur Geschichte der mathematischen Wissenschaften_, Heft XXVII.

In general, each chapter begins with a brief statement of the main features of the subject to which the chapter is devoted and some historical notes relating to the origin of the subject. This is followed, in order, by a selection of classic works, newer textbooks, fundamental memoirs, and articles devoted to special parts of the subject. Great care has been exercised as regards the exact titles and references, but the number of these is so large as to make errors almost unavoidable. Some of them have been corrected on the five pages of Nachträge und Verbesserungen. Among those which have escaped we may mention W. J. Stringham on page 219 in place of W. I. Stringham, J. J. Hutchinson on pages 124 and 242 in place of J. I. Hutchinson, two incorrect numbers (7, 518) following Blichfeldt on page 236, and two (205, 218) following Halsted on page 241. The latter numbers should have been entered under Halphen.

The first forty-seven pages are devoted to the history of mathematics, biography, collected works, periodicals, bibliography, and encyclopedias. For many readers this will doubtless prove the most valuable part of the volume, since it contains a large amount of information which cannot be easily gathered