Il Passato ed il Presente delli Principali Teorie geometriche.
Terza Edizione accresciuta di uno Sguardo allo Sviluppo della
Geometria in quest'ultimo 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 edi-
tion 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 corre-
sponding 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.

Führer durch die mathematische Literatur mit besonderer Berück-sichtigung der historisch wichtigen Schriften. Von FELIX MÜLLER. Leipzig und Berlin, Teubner, 1909. x + 252 pp.

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