suspicion where its authors have rejected doubtful observations. Professor Merriman recommends that negative characteristics for logarithms should be used in computations. This is largely a matter of custom ; most computers prefer the use of positive characteristics, inserting -10 when there is likely to be any doubt.

One of the most interesting chapters is that on spherical geodesy, containing a short historical account of the measurement of meridian arcs and the gradual approach to our present knowledge of the form and dimensions of the earth's surface. The whole work is fully illustrated by solved problems, and the references to government reports and other works on allied subjects will enable the reader to obtain everything necessary for understanding every part of the subject.

<div align="right">ERNEST W. BROWN.</div>

Premiers Principes de Géométrie Moderne. Par ERNEST DU-
PORCQ. Paris, Gauthier-Villars, 1899. vii + 160 pp.

THIS useful book is intended to give to students who have some acquaintance with analytic geometry, a liking for the purely geometric point of view. It is not a work on pure geometry as a self-contained science freed from arithmetic ; for instance, the notion of imaginary points is sketched in the preliminary chapter from the historic algebraic standpoint. A purist (say von Staudt) would energetically oppose such statements as : "Le point * * * ne représente rien de géométrique lorsqu'il est imaginaire" (p. 9) ; and would proceed, at any cost, to give a geometric meaning to a point however imaginary.

The book takes, then, a middle path. The ground won by the application of algebra to geometry shall be handled geometrically whenever convenient. That it is very frequently convenient is to be shown, in a way that shall strengthen the geometric sense. For the cultivation of the geometric sense is a very important * aim of a mathematical course, toward which algebraic methods contribute little.

The ground to be covered is that of the simpler transformations, viz., homography, correlation, inversion, quadratic transformation of a plane, Lie's transformation of lines into spheres.

The body of the book (Chapters II.-V.) is devoted to homography and correlation, and covers the principal proper-

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* According to the author's introduction, it is the principal aim ; which seems too strong a statement.

ties of the conic, of the range or pencil of conics, of conics
"harmonically circumscribed," or apolar, to a given conic; of
the quadric, of the range or pencil of quadrics, and of quad-
rics and cubic curves "harmonically circumscribed" to a
quadric.

The remaining transformations are handled in the last
chapter (Chapter VI.) in briefer fashion ; and the book ends
with seventy exercises whose sources are not stated. The
author has carried out his intention artistically and, given
that he is addressing *intelligences d'élite*, excellently.

The actual titles of foreign journals should be given.
"Ann. de Math." might be an American, a German, or an
Italian periodical.

I see no reason for calling a circle discovered by La Hire
"cercle de Monge" (p. 64). On the other hand the orthoptic
sphere of p. 107 might fairly be called "Sphère de Monge."
On this latter page the reference of the footnote should be
to No. 86, not No. 80.

The "transformation par rayons vecteurs réciproques" of
p. 11 is finally called inversion. It is attributed to Bella-
vitis (1836). Some assign it to Plücker (1831).

A smaller point of history may also be raised. An inter-
esting theorem occurring three times in the book under dif-
ferent forms (pp. 116, 132, 138) is in effect as follows : that
the tangents at the points where a tangent of an asteroid
(hypocycloid of class 4) meets the curve again meet on the
cusp circle. This theorem is attributed to Laguerre. R.
A. Roberts once told me that the theorem stated in the cor-
relative form for the lemniscate, was well known in Dublin
and was there attributed to Casey. It would be worth
while to ascertain whether Casey anticipated Laguerre.

<div style="text-align:right">F. Morley.</div>

*Opinions et Curiosités Touchant la Mathématique d'après les
Ouvrages Français des XVIᵉ, XVIIᵉ et XVIIIᵉ Siècles.* Par
Georges Maupin. Paris, Carré et Naud, 1898. 199 pp.

The book seems to be addressed, not to the mathematician,
nor to the historian of mathematics, but to the general
reader, with the view of entertaining him and creating in
him a love for the history of the science. In twenty-seven
chapters there has been gathered together from old French
writers, mostly unknown to our time, a miscellaneous mass
of material relating to the squaring of the circle, the value
of mathematical studies, pleas for the study of this science in