scholarship. This expectation is enhanced by the fact that the author confines himself to an early period and that the present volume is a second edition of a valuable work that has been before the public for sixteen years. The typographical errors are few and insignificant. The most serious noticed occurs on page 4, where it is stated that the earlier edition appeared in 1900, instead of 1890.

In 1838 Liouville demonstrated a property of the special forms which were afterwards called wronskians by Muir (1881) and later writers. According to Anissimov * this seems to be the first important result relating to these useful forms, but the paper is not mentioned by our author although it falls within the period covered. Neither is it included in the bibliography cited above.

The present volume is almost twice as large as the first edition and includes a number of papers not there mentioned. The greatest difference between the two editions is in the facts that the papers relating to special forms are brought together in the new edition and that a table showing the advance of determinants from 1813 to 1841 has been added. The use of smaller type for quotations has greatly improved the appearance of the text. The completeness and attractiveness of the book combine to make it indispensable to the student of determinants and their history. G. A. MILLER.

A First Course in Analytical Geometry, Plane and Solid, with Numerous Examples. By CHARLES N. SCHMALL. New York, Van Nostrand, 1905. 8vo. 7 + 318 pp.

ON the whole, this little book resembles so closely the ordinary text on the subject, both as to material and treatment, that a detailed account is scarcely necessary. Mention of the few points in which it does depart from the general type of text will be sufficient. In the chapter on loci, the usual examples from physics, economics, statistics, etc., are omitted, and attention is confined exclusively to purely geometric problems. This omission will probably be regarded as a fault or a merit according to one's views on the recently discussed relations of mathematics to physics and other subjects. The chapter on the circle precedes that on the transformation of coordinates, reversing

* Encyclopédie des Sciences Mathématiques, Tribune publique I, 1906, p. 3.