without a teacher, though too few exercises are given to prove his interpretations or measure his skill. Now follow in rapid review the outlines of four important methods, though much too brief to be of maximum service. The treatment of axonometry is confined almost entirely to the proof, elegant in itself, of Polke's theorem that any plane quadrilateral is similar to some plane (parallel) projection of a given tetrahedron. Nine interesting applications are hastily sketched. The determination of apparent contour is the most interesting part of the book; the applications to the anchor ring and hyperboloid of revolution could hardly be followed by a reader to whom these figures are new. Stereographic projection is theoretically discussed, the invariant property of circles and angles being established. The depiction of the edges of a cube on a plane perpendicular to a diagonal is the only illustration. Finally, a few pages are devoted to relief perspective, generalizing for three dimensions what was done earlier in the book for two. A number of instructive notes are added, more fully explaining various points in the text.

The only typographical errors that would cause confusion are on page 23, where regions II, III should be interchanged, and on pages 32, 33, where the letters F_0, F_2 in the text refer to P_0, P_2 respectively in the figures.

VIRGIL SNYDER.

La Géométrie Analytique Générale. Par H. LAURENT. Paris, A. Hermann, 1906. vii + 151 pp.

MANY text-books, chiefly on analysis and algebra, have been written by M. Laurent during the last twenty-five years. The present little volume, with its far-reaching title, suggests that the author is turning his attention, for the moment, to the field of geometry. One soon finds that the underlying thought is that geometry is merely a branch of the theory of numbers. The author has certainly succeeded admirably in emphasizing the fact that geometry may be considered as a purely abstract subject capable of treatment by analytical methods without reference to space perceptions. However, the work is not, as a whole, just what one would desire as a brief first book on the subject of "General analytical geometry." For instance, one feels that much of the strength of the book has been lost by spending an undue amount of time on the one topic of orthogonal substitutions and by delaying the definition of a group too long.

After a three page introduction on trigonometry (where the ratios are defined analytically), the reader is plunged at once into the main topic of the book—orthogonal substitutions. In the conclusion half a dozen pages are devoted to some general remarks about groups of substitutions. A definition of a group is given, and the statement is made that the orthogonal substitutions form a group. In the next paragraph the author says that all possible geometries are, fundamentally, the study of groups of substitutions and their invariants. Should this most important fact be relegated to the conclusion and there passed over lightly? May not the student regard it as a mere afterthought? Is it one of the conclusions that have necessarily arisen in his mind during the study of this book? Indeed, one fears that he would not have sufficient breadth of view to appreciate the meaning of the sentence.

Another criticism that must be made is in regard to the absence of any trace of a bibliography. It may be unnecessary to give references in secondary school books (though one can certainly raise the question even there); but it does seem most unwise to omit from a text of this nature all reference to the literature of the subject. E. B. COWLEY.

Tafeln unbestimmter Integrale. Von G. PETIT BOIS, Bergingenieur in Lüttich. Leipzig, Teubner, 1906. 4to. xii + 154 pp.

THE book contains 2,500 or more indefinite integrals, unnumbered. This is five times as many as occur in B. O. Peirce's Short Table of Integrals, but the latter would be, in general, the more useful book on account of its containing also definite integrals and many auxiliary formulas. In the three-page index to the Tafeln are given the 110 groups into which the formulas are divided. About three-fourths of the integrals are of algebraic functions. As an introduction, there are 49 transformation formulas. The books most used in the compilation were those of Schubert, Minding, Sohncke, Frenet, Graindorge, Brahy, Gregory, Roberts, and Carr. EDWARD L. DODD.

Annuaire du Bureau des Longitudes pour l'An 1909. Paris, Gauthier-Villars.

THE volume of the Annuaire for the current year is without the chemical and physical constants and certain astronomical tables which are inserted in the even-numbered years. As usual