tion, distribution, congruence, and continuity, with the "axiom of parallels." The only spatial axioms are Nos. 3-7 in group I., all the rest are either linear or "planar." They show us more than ever the truth of the saying of M. Poincaré: all axioms are but definitions in disguise. But in the present case the disguise is easily pierced. After demonstrating by means of these weapons a particular case of Pascal's Theorem, and the ordinary laws for the theory of plane areas, we come to Desargue's theorem on the intersection of the joins of the homologous vertices of triangles whose homologous sides are parallel. We are shown that it is impossible to prove this theorem without the aid of either the axioms of congruence or of spatial axioms. From a new segmentary calculus based on this theorem we are led to the equation of a straight line, and ultimately to the construction of a Geometry of space. In the German edition the author does not deal with the possibility of discussing a Geometry without the axiom of parallels, or with points as elements coupled with the idea of groups of displacements as in Sophus Lie's "travaux fondamentaux et féconds." But a few interesting remarks on the subject have been added to this translation, and of these Prof. Halsted has made use in his review of Manning's Non-Euclidean Geometry, in the *Gazette*, No. 29, p. 94.

(14) The handsome volumes of M. Gournerie on Descriptive Geometry take us back to the days of Chasles and Poncelet. The first edition appeared in three parts from 1860 to 1864. Poncelet alludes to it in his *Traité des propriétés progressives des figures* as the most complete, the most accurate, and "le plus rationnel" of any work on this subject that had as yet appeared. Chasles became its sponsor in a very practical way, by speaking highly of it before the *Académie des Sciences.* The third edition of the third part has been edited by Professor Lebon, of the Lycée Charlemagne, who succeeded the author in his chair in the *Conservatoire des Arts et des Métiers,* and who is, moreover, the author of a large work on the same subject. Among the more interesting features of the part which has just appeared, we may mention the simple and elegant presentation of the theory of Curvature of Surfaces. In this, as well as in the proof of Euler's formula giving the curvature of a normal section, the infinitesimal calculus is not used, the author founding his treatment on Bertrand's Theorem (Salmon, *Geom. of Three Dim.*, p. 265, note). We find Meunier's Theorem (*loc. cit.*, p. 256) applied to the construction of the radii of curvature and the osculating planes of a curve given by its projections. The author follows Dupin's treatment of the lines of curvature of surfaces of the second order. M. Lebon brings the book up to date by notes historical and illustrative.

Differential and Integral Calculus. By E. W. NICHOLS. Pp. xii., 394. 7s. 6d. 1900. (Heath, Boston.)

This is essentially a book for beginners, by which we mean that the author has laboured to present his subject in the clearest and simplest manner, removing "all obscurities and mysteries," and smoothing the path of the student generally. Accordingly there is more explanatory matter than is generally to be found in a book for "the undergraduate courses of our best Universities, colleges, and technical schools." In some ways a book of this type is very useful to the tyro, especially if he be a private student. But there is always the danger that in removing every statement that may cause the student to exercise his wits, we are losing an opportunity of stimulating his attention and cultivating a valuable faculty. Mr. Nichols is to be commended for the skilful way in which the geometrical, mechanical, and electrical applications are worked in throughout the book. The historical notes are concise and to the point. Some twenty pages are given to differential equations. The volume is well bound and printed, and the author's boast that he gives the reader a "clear and open" page is amply justified.

Differential and Integral Calculus for Beginners. By E. EDSER. Pp. vi. 253. 2s. 6d. 1901. (Nelson.)

Yet another Calculus "adapted to the use of Students of Physics and Mechanics," "shorn of all extraneous difficulties," providing the "physical student with a valuable engine of research," the student finding "no difficulties which cannot be overcome by application and perseverance"! Assuming on