

The book closes with a section devoted to spherical cubics. There are 152 pages, a bibliography, and a short index.

The book will find its greatest use in technical schools. Spherical trigonometry has come to be counted as one of the technical studies and taught in connection with geodetic surveying or with astronomy. It is the same with spherical analytic geometry from Dr. Heger's point of view, and the field of application is narrower.

Geometry upon the sphere is most interesting when studied as a correspondence between the sphere and some other surface—in particular, the plane. This point of view is hinted at in section 8 in explaining Gudermann's axial coordinates, but no general theory of correspondence between sphere and plane is worked out.

Dr. Heger's analytical geometry amounts to a correspondence between the sphere and the projective plane. There is another geometry upon the sphere arising from a one to one correspondence with the plane whose results are quite as useful, in their way, but which does not come within Dr. Heger's field of view.

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*Die Elemente der Mathematik.* Von ÉMILE BOREL, Professor an der Sorbonne zu Paris. Vom Verfasser genehmigte deutsche Ausgabe, besorgt von PAUL STÄCKEL, Professor zu Karlsruhe i. B. Erster Band: *Arithmetik und Algebra*. Mit 57 Textfiguren und 3 Tafeln. Leipzig und Berlin, B. G. Teubner, 1908. xvi + 431 pp.

This work is a German translation, or rather a "Bearbeitung," in one volume, of the three French booklets published by Borel in 1903. Borel traverses in his texts the ground to be covered in arithmetic and algebra by pupils between the ages of 14 and 17, in accordance with the courses of study laid out officially in 1902. The distinctive feature of this movement lies in the emphasis laid on graphic work, on the concept of a variable and of a function. Stäckel says in his preface to the German edition that, in view of the wide divergence of opinion as to what can be accomplished in this line with elementary pupils, the only way of arriving at an understanding and thereby at an actual realization of the contemplated reform, appears to be in showing by an example just what that reform really aims to achieve and how the subject can be developed