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Review

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by motion!" This is misleading, if, as we presume, forms are meant by elements. Enriques only uses motion by way of illustration. His geometry is founded on carefully formulated axioms, in which the idea of motion has no part. F. S. M.

**Geometrical Conics.** By CAUNT AND JESSOP. (London: Edward Arnold. Price 2s. 6d.)

This is a small book of 80 pages. The authors define the conic as the section of a right circular cone, and from this definition they deduce the focus and directrix property, the bifocal property and the construction for describing the curve by mechanical methods. A short account is given of the polar properties of the circle, on which, by the method of projection, the authors base the theory of pole and polar and of conjugate diameters in the conic. The book deserves commendation for giving prominence to the idea of the continuity of the different species of the conic. We think, however, that the explanation of the method of projection is imperfect. In Chapter I. the conic is defined as the section of a *right* circular cone, but in Chapter III. the section of *any* cone on a circular base is called a conic; and it is not proved that every conic, defined by the focus and directrix property, can be projected into a circle. R. H. PINKERTON.

**The First Book of Euclid's Elements, with a Commentary based principally on that of Proclus Diadochus.** By W. B. FRANKLAND. Pp. xvi, 139. 1905. (Cam. Univ. Press.)

Mr. Frankland has followed up his excellent *Story of Euclid* by an "anthology of the best commentary on any part of the Elements ever composed." We observe with regret from the preface that untoward circumstances of a private nature have prevented the earlier appearance of the book before us. But such is its quality and that of its predecessor that it is evident that Mr. Frankland possesses a large measure of the equipment required in the writer on such a topic as the parallel postulate. We therefore welcome the hint given us in the first chapter, that some day there will appear from the skilful and learned pen of the author an historical and critical study of that problem. We could wish we had space for many quotations from this witty and charming volume. Here is one which would have gladdened the heart of the author of *Euclid and his Modern Rivals*, and of *Alice in Wonderland*: "Easy introductions to Euclidean dogmatics do not expose clearly and precisely the principles at their bases—they need to be exposed. Such plebeian roads . . . were beginning to appear, like much else reckoned modern, in the *Commentary of Proclus*." "Parallelism is similarity of position. This is good illustration, but bad analysis." We must content ourselves with saying that these "innocent studies" form an eminently valuable addition to the history of Geometry, and we may add, an attractive volume.

**Euclid's Parallel Postulate. Its Nature, Validity, and Place in Geometrical Systems.** By J. W. WITHERS, Ph.D. Pp. vii, 192. 1905. (Kegan, Paul.)

This book is the thesis presented to the Philosophical Faculty of Yale University for the degree of Ph.D. by the author. He gives an account of the history of the postulate up to the time of the discovery and development of non-Euclidean systems, and dwells upon the significance of the latter. He then embarks on the philosophical side of his theme. First he discusses the psychology of the parallel postulate and its kindred conceptions, showing that its validity is not to be settled by any empirical investigations. Next he deals with the number and variety of possible space geometries. Finally he shows the inferences that follow as to the nature of space when the validity of the parallel postulate is denied. On the whole we may consider the book as a compilation in which the