

separately the right and left generators. Refer the pairs of right generators to the pairs of points where they meet a conic of the surface.

Then we are to prove that if p_1, p_2, p_3 are pairs of points on a conic, and the pair harmonic with p_2 and p_3 be p_1' , and the pair harmonic with p_1 and p_1' be p_1'' , then p_1'', p_2'', p_3'' are in involution. In other words, replacing the pairs of points by the lines through them, we are to prove that a triangle and its polar triangle as to a conic are in perspective, a known elementary proposition. The ten pairs of points on the conic are in fact the points in which the lines of the configuration 10_3 , the intersection of a plane with a complete five point cut the conic to which it is self polar.

Thus as three pairs of points on a conic determine the configuration of ten pairs of points, so three quadrilaterals in the surface determine a configuration of ten quadrilaterals, and replacing each quadrilateral by its diagonal pair we have the configuration of Professor Study.

Haverford College,
November, 1898.

BESSEL'S FUNCTIONS.

Einleitung in die Theorie der Bessel'schen Funktionen, von Professor J. H. GRAF und Dr. E. GUBLER, Erstes Heft : Funktionen erster Art. Bern, 1898, Wyss & Co.

IN the last few years the study of Bessel's functions has been enriched by many contributions, the subject generalized for the complex variable, and the premises much more carefully defined.

Among English speaking investigators the interest seems to lie chiefly in two directions, theoretical consideration of the differential equation, and practical applications, numerical tabulation, etc.

The book under review does not favor any particular side but may be said to put the most emphasis upon the definite integral. Numerical tabulation is not touched upon in the part which has appeared ; the remaining part, soon to appear, may have a chapter devoted to this purpose.

The first feature is a carefully arranged historic introduction, which contains an extensive list of books and memoirs