12. The formulas of Euler (and Rodrigues), which give rationally in terms of three parameters the nine coefficients of an orthogonal transformation in space, are available for expressing the vertices of any polar triangle of the conic

$$x_1^2 + x_2^2 + x_3^2 = 0.$$

This gives a means of discussing curves of the second and third orders, at least, which contain infinitely many inscribed polar triangles of a conic. Professor White's preliminary communication exhibited the method as applied to conics. The further question was raised, what sort of curve is the locus of points whose coördinates are the eulerian parameters of polar triangles inscribed in a single conic, or of orthogonal transformations which rotate the axes through the surface of an orthogonal quadric cone.

THOMAS F. HOLGATE,
Secretary of the Section.

EVANSTON, ILLINOIS.

SOME GROUPS IN LOGIC.

BY PROFESSOR E. W. DAVIS.

(Read before the Chicago Section of the American Mathematical Society, January 2, 1903.)

DE MORGAN has pointed out * that his eight forms of proposition identical with the A, E, I, O, and their contranominals of the older logic, can be derived from any one by the three operations of reversing the subject, reversing the predicate, denying the copula. If, in fact, we denote the operations in question by s, p, and f respectively, we have

$$Ap = E, \quad Af = O, \quad Afp = I;$$

while sp changes any proposition to its contranominal $X \leqslant Y$ to $Y \leqslant X$; or, what is the same thing to $\bar{X} \leqslant \bar{Y}$. Here $\leqslant$ is the sign of implication and the bar written over a letter or sym-

* Formal Logic, p. 63 et seq.