

## XVII

## A THEOREM ON SPHERICAL QUADRILATERALS AND SPHERICAL CONICS\*

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The following notice, by the President, Sir William R. Hamilton, of a theorem derived from his Researches on Quaternions, was read.

Let  $AC'A'B'$  be called a *spherical parallelogram*, if  $A', B', C'$  bisect the sides  $BC, CA, AB$  of a spherical triangle  $ABC$ ; and let it be said that the corner  $A$  of the triangle is the point which *completes the parallelogram* when  $A'B'$  and  $A'C'$  are given as two adjacent sides thereof.

Take any spherical quadrilateral,  $KLMN$ , and any point on the same spheric surface,  $P$ ; draw the four arcs  $PK, PL, PM, PN$ , and complete, in four points,  $K', L', M', N'$ , the four spherical parallelograms, of which the given pairs of adjacent sides are  $PK, PL$ ;  $PL, PM$ ;  $PM, PN$ ;  $PN, PK$ . Then the four new points,  $K', L', M', N'$ , form a new spherical quadrilateral, such that its four sides,  $K'L', L'M', M'N', N'L'$ , touch a certain spherical conic, having the poles of the diagonals  $KM, LN$  of the old quadrilateral for its foci.

This theorem was stated to follow as an easy corollary from what Sir William Hamilton had already communicated to the Academy respecting quaternions.

\* [See *Elements*, p. 360, article 306.]

