THE GEOMETRY OF A NET OF QUADRICS IN FOUR-DIMENSIONAL SPACE.

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Among the reasons why the study of the geometry of a net of quadrics in four-dimensional space should prove interesting and attractive there are two which immediately present themselves even before this study is commenced; they are, first, that the base curve of the net, through which all the quadrics pass, is a canonical curve and, second, that the Jacobian curve of the net — the locus of the vertices of the cones belonging to it — is birationally equivalent to a plane quintic.

In space of any number $n (> 2)$ of dimensions a net of quadrics has a base locus, of order eight, and a Jacobian curve; these must both figure prominently in any account of the geometry of the net of quadrics. The polar primes[1] of any point in regard to the quadrics of the net have in common an $[n-3]$ *except when the point lies on the Jacobian curve, when they have in common an* $[n-2]$; there is thus a singly-infinite family of $[n-2]$'s in $(1, 1)$ correspondence with the points of the Jacobian curve, and it is found that each $[n-2]$ has $\frac{1}{2} n(n-1)$ intersections with the Jacobian curve.[2] This is analogous to the well-known result in [3] that, when a point lies on the twisted sextic which is the locus of vertices of cones belonging to a net of quadric surfaces, the polar planes of the point in regard to the quadrics all pass through a trisecant of the sextic. The

[1] When we are concerned with geometry in a linear space $[n]$ of n dimensions the word *prime* is used to denote a linear space of $n-1$ dimensions; the word *primal* is used to denote any locus, other than a linear space, of $n-1$ dimensions. In [4] we also use the term *solid* to denote a three-dimensional space.

[2] Cf. Edge: *Proc. Edinburgh Math. Soc.* (2), 3 (1933), 259—268.