THE WEB OF QUADRICS

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1. *Introduction.* A triply infinite linear system of quadrics was first defined by De Jonquières[*] in 1862. Such a linear system later became known as a web.

The characteristics of a web of quadrics, with and without basis elements, have never been completely or accurately given, although many mathematicians have investigated this problem during the past seventy-five years.[†] Also, the web with a basis double point, that is, the web of quadric cones, has not been treated.

The purpose of this paper is to give a brief summary of results, correcting errors and completing the sets of characteristics; also, to derive the characteristics of a web of quadric cones. References to more complete discussions of certain parts are given.

In all cases, the quadrics will be considered as loci of points. Each web type has its dual, whose treatment in plane coordinates is algebraically identical with that in point coordinates.

2. *The Web and the Associated Involution.* The web of quadrics has the equation

$$\sum \lambda_i f_i = 0, \qquad (i = 1, 2, 3, 4),$$

in which the $f_i = 0$ are equations of quadrics with given basis elements. The web has a jacobian quartic surface J.

The quadrics of the web in a 3-space (x) are in $(1, 1)$ correspondence with the planes of a 3-space (y). The correspondence is defined by the equations

$$\rho y_i = f_i, \qquad (i = 1, 2, 3, 4).$$

* De Jonquières, Journal de Mathématiques, (2), vol. 7 (1862), p. 412.

† Encyklopädie der Mathematischen Wissenschaften, vol. III₂, pp. 250–254. Pascal, *Repertorium der höheren Mathematik*, vol. II₂ (1922), pp. 629–631. Virgil Snyder and F. R. Sharpe, *Space involutions defined by a web of quadrics*, Transactions of this Society, vol. 19 (1918), pp. 275–290.