sets of conjugate diameters of Q.

Again if we join the vertices of any triangle from (ii) to the centre of Q, we get a set of three mutually perpendicular lines.

COROLLARY 1. *C passes through the three principal axes of Q.* For e passes through A, B, C which are the traces of principal axes.

COROLLARY 2. *If P is the central plane of which p is the trace then the normal to P at the center and the diameter of which P is the diametral plane lie on 'C.'*

From the definition it can be proved that the pole of p w.r.t. any conic of the family $q+\lambda\Omega=0$ lies on e. As the pole of p w.r.t. Ω is the trace of any normal to P, the normal at the center lies on C. Again the pole of p w.r.t. q, which must lie on e, is the trace of the diameter D of which P is the diametral plane. Hence D must lie on C.

MATHEMATICAL NOTES

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ELEMENTARY PROOF THAT e IS IRRATIONAL

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The following variation on the usual proof of the irrationality of e is perhaps slightly simpler. Suppose that e is rational, say $e=a/b$. Then

$$b/a = e^{-1} = \sum_{n=0}^{\infty} (-1)^n/n!,$$

and multiplication by $(-1)^{a+1}a!$ and transposition of terms gives

$$(-1)^{a+1}\left\{b(a-1)! - \sum_{n=0}^{a} (-1)^n a!/n!\right\} = \frac{1}{(a+1)} - \frac{1}{(a+1)(a+2)} + \frac{1}{(a+1)(a+2)(a+3)} - \cdots.$$

The right side has a value between 0 and 1 since the alternating series clearly converges to a value between its first term and the sum of its first two terms. But the left side is an integer, so we have a contradiction.