559.

[NOTE ON INVERSION.]

[From the *Proceedings of the London Mathematical Society,* vol. v. (1873—1874), p. 112.]

THE inverse of the anchor ring (in the foregoing paper* called the cyclide) is in fact the general binodal cyclide or binodal bicircular quartic; viz. assuming it to be a cyclide (bicircular quartic), to see that it is binodal, it need only be observed that the anchor ring is binodal (has two real or imaginary conic points, viz. these are the intersections of the circles in the several axial planes); and to see that it is the general binodal cyclide, we have only to count the constants; viz. the general cyclide or surface

$$(x^2+y^2+z^2)^2+(x^2+y^2+z^2)(\alpha x+\beta y+\gamma z)+(a,\ b,\ c,\ d,\ f,\ g,\ h,\ l,\ m,\ n)(x,\ y,\ z,\ 1)^2=0$$

contains 13 constants, and therefore the binodal cyclide $13-2$, $=11$ constants. But the anchor ring, irrespective of position, contains 2 constants; centre of inversion, taken in given axial plane, has 2 constants; radius of inversion, 1 constant; in all $2+2+1$, $=5$ constants; or taking the inverse surface in an arbitrary position, the number of constants is $5+6$, $=11$.

* By Mr H. M. Taylor: Inversion, with special reference to the Inversion of an Anchor Ring or Torus, (*Lond. Math. Soc. Proc.*, same volume, pp. 105—112).