Let O be the circumcentre of the triangle ABC, and R the circumcentre of APQ. Then RO has equal projections on AB and AC (each being $\frac{1}{2}$BP); and hence RO is parallel to the bisector of the angle BAC. Therefore the locus of R is a straight line through O, parallel to the bisector of the angle BAC; and thus the circumcircle of APQ always passes through a fixed point A′, which is the image of A in RO. Hence, by the proposition stated above, PQ envelopes a parabola of which A′ is the focus, and which touches AB and AC.

It is obvious from the above also that if any circle through A and A′ meets AB and AC in P and Q, then BP = BQ; and the following more general theorem may also be proved very easily:—

If a series of circles pass through two fixed points A and A′, and if two straight lines APQR ... and AP′Q′R′ ... meet these circles in the points P, Q, R, ... and P′, Q′, R′, ..., then PQ : QR : ... = P′Q′ : Q′R′ : ....

This theorem may also be got by inversion; it may in fact be got by inverting the theorem that the anharmonic ratio of a pencil is constant, by taking the particular case of a number of concurrent transversals.

Third Meeting, January 9th, 1891.

R. E. Allardice, Esq., President, in the Chair.

On the Heating of Conductors by Electric Currents, and the Electric Distribution in Conductors so heated.

By John M'Cowan, M.A., B.Sc.

The solution of the equation.

$$\sqrt{\{(x-a)(x-b)\}} + \sqrt{\}(x-c)(x-d)\}} = e.$$

By J. D. Hamilton Dickson, M.A.

1. If $P = a + b - c - d$, and $K = cd - ab$, the solution of the equation

$$\sqrt{\{(x-a)(x-b)\}} + \sqrt{\{(x-c)(x-d)\}} = e \qquad \ldots \qquad (1)$$

may be most readily found by putting $(x-a)(x-b) = z^2$; whence