Eighth Meeting, June 8th, 1894.

Dr C. G. KNOTT, President, in the Chair.

On the Highest Wave of Permanent Type.

By JOHN M'COWAN, D.Sc.

On a Problem in Tangency.

By G. E. CRAWFORD, M.A.

FIGURE 17.

Let AOB, DOE be any two intersecting chords of a circle. Required to inscribe a circle in one of the compartments, as BOE.

Draw OF bisecting the angle BOE and let it cut the circle in F. Draw FM perpendicular to AB.

Join C′ (the centre of the circle) to O and produce to cut the circle in G. [Draw GH in any direction equal to FM, and join C′H. Draw OK parallel to GH cutting C′H in K.] Cut off OL = LQ = OK. Join LF and with Q as centre and radius FM or GH describe a circle cutting LF in S. Draw QSR and draw a parallel to it through C′ cutting OF in F′ and the circle in P′. Then F′ shall be the centre of the required circle.

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PROOF.—Draw F′M′ perpendicular to OB, draw through F a parallel CP to C′P′, and join OP′, producing it to cut CF in P.

Then $\quad LQ : QS :: OL : FM :: OK : GH :: C'O : C'G$
$\quad :: C'O : C'P'$

∴ the △'s LQS and OC′P′ have an angle common and the sides about that angle proportional.

∴ $\quad \angle SLQ = \angle P'OC'$

∴ $\quad$ LF is parallel to OP.

Hence $\quad OL : FP :: CL : CF$
$\quad :: QL : QS,$ since the △'s QSL, CFL are similar
$\quad :: OL : FM$

∴ $\quad FP = FM.$

But $\quad F'P' : FP :: OF' : OF$
$\quad :: F'M' : FM$

But $\quad FP = FM$

∴ $\quad F'P' = F'M'$

and C′ is the centre of circle AGB

∴ a circle with centre F′ and radius F′M′ will touch both OE and OB and will touch the circle AGB at P′.

The Algebraic Solution of the Cubic and Quartic in x by means of the Substitution

$$\frac{\lambda x_1 + \mu}{1 + x}$$

By CHARLES TWEEDIE, M.A., B.Sc.

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