Of his so-called universal solution I will consider only that of the sixth degree. He assumes that—

$$x^6 + mx^5 + nx^4 + bx^3 + px^2 + tx + q = 0$$

$$\left\{x^2 + \frac{m}{a}x + y\right\} \left\{x^2 + \frac{m}{b}x + z\right\} \left\{x^2 + \frac{m}{c}x + w\right\} = 0$$

He then puts

$$(1) \quad n - \frac{m^2}{A} = \frac{A_o}{2m} - \frac{m^2}{2A^2} = y + z + x$$

$$(2) \quad p - \left\{\frac{m^2 n}{B^2} - \frac{m^4}{B^3}\right\} = \frac{Bt}{m} = yz + yw + zw.$$

$$(3) \quad q = yzw$$

$$(4) \quad oA^3 - 2mnA^2 + 2m^3A - m^3 = 0$$

$$(5) \quad tB^4 - mpB^3 + m^3nB - m^5 = 0.$$

From (4) and (5) find A and B

Then x, y, z are found from 1, 2, 3 by means of a cubic equation.

The author incidentally remarks that the proper combination of the three values of A, and the four values of B are easily determined by a little practice. The author also says that it is evident that by comparing coefficients the values of 1/a, 1/b, 1/c can be obtained. The novice will find some difficulty in doing it. The real point of difficulty, however, is that we have eight unknown quantities, viz., a, b, c, x, y, z, A, B, and nine equations to be satisfied, viz., five by equating coefficients, and four from (1) and (2). So that the boasted solution is after all only a solution when there is some condition placed on the roots.

Graphic Methods in Elementary Mathematics.

By Robert J. Aley.

The Automatic Temperature Regulator.

By Chas. T. Knipp.

(Published in the Physical Review, Vol. XII, No 1, January, 1901.)

The Cayleyan Cubic.

By C. A. Waldo and John A. Newlin.

The Use of the Bicycle Wheel in Illustrating the Principles of the Gyroscope.

By Chas. T. Knipp.

(Published in the Physical Review, Vol. XII, No. 1, January, 1901.

The Cyclic Quadrilateral.

By J. C. Gregg.

PROBLEM.

The opposite sides of a quadrilateral FGHI inscribed in a circle, when produced, meet in P and Q; prove that the square of PQ is equal to the sum of the squares of the tangents from P and Q to the circle.—No. 80, page 470, Phillips and Fisher's Geometry.

SOLUTION.

(See Fig. I.)

On PO and QO as diameters draw circles (centers S and T) and cutting circle O in C, D, E and K. QK and PD are tangent to O. Through the points Q, F and G draw a circle cutting PQ in A. Then $\angle PHG = \angle GFI = \angle QAG$ $\therefore$ $\angle PAG$ is the supplement of $\angle PHG$ and PAGH is cyclic, and

$PQ.PA = PF.PG = \overline{PD}^2$ and

$PQ.QA = QH.QG = \overline{QK}^2$ and adding these two equations

$\overline{PQ}^2 = \overline{PD}^2 + \overline{QK}^2$ — Q. E. D.