V. *Conclusion.*

The method used to set up the convergency conditions for the infinite series expressing the roots of the four-term equation derived from the equations formed in accordance with (*a*), (*b*) (*c*) of Article I when the convergency conditions of the three-term equation are known, and to set up the convergency conditions for the five-term equation when the convergency conditions for the four-term equation are known, can be used to set up the convergency conditions for the t-term equation when the convergency conditions for the $(t-1)$-term equation are known.

In fact, the convergency conditions for an equation of any number of terms can be written mechanically.

For the t-term equation

$$f(y) = 0 \tag{57}$$

it is always possible to determine the s of the substitution

$$y = z^s \tag{58}$$

so that the convergency conditions of the infinite series expressing the roots of the t-term equation

$$f(z^s) = 0 \tag{59}$$

derived from the equation formed from (59) in accordance with (*a*) of Article I, or derived from the two equations formed from (59) by (*b*) and (*c*) of Article I are satisfied. The roots of the t-term equation (57) are found from the roots of the equation (59) by substituting in (58).

It is therefore always possible to find all the roots of an algebraic equation by means of infinite series.

LEHIGH UNIVERSITY,
April, 1908.

THE DEDUCTION OF THE ELECTROSTATIC EQUATIONS BY THE CALCULUS OF VARIATIONS.

BY DR. ARTHUR C. LUNN.

(Read before the Chicago Section of the American Mathematical Society, April 17, 1908.)

THE construction of a mathematical theory of classes of physical phenomena for which no detailed mechanical explanation