From equation (6) it is seen that the coefficients of this polynomial,

$$\frac{z(1-z)^k}{s^{k+1}} = \frac{s^{n-k-1}MX}{(1-z)^{n-k}} \qquad (k = 1, \cdots, n-1),$$

are expansible as power series in $x_1, \cdots, x_p$, with positive coefficients, vanishing for $x_1, = \cdots = x_p = 0$. Hence the theorem is proved.

UNIVERSITY OF CHICAGO,
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KOWALEWSKI'S DETERMINANTS.

Einführung in die Determinantentheorie einschliesslich der unendlichen und der Fredholmschen Determinanten. By GERHARD KOWALEWSKI. Leipzig, Veit & Comp., 1909. 540 pp.

A PRELIMINARY survey of the contents of this book may best be obtained by dividing it into three nearly equal parts. The first of these parts comprises Chapters I–X and deals with the pure theory together with the single application to systems of linear equations * — a subject both historically and logically so intimately connected with the theory as to be almost inseparable from it. In the second part — Chapters XI–XVI — certain applications to algebraic, analytic, and geometric problems are treated. The third part consists of Chapters XVII–XIX and deals with two extensions of the idea of determinants obtained by allowing the order of the determinant to increase indefinitely. Both the theory of these determinants (infinite determinants and Fredholm determinants) and the closely related theory of the corresponding generalizations of systems of linear equations (linear equations with an infinite number of variables and linear integral equations) are treated in these chapters. While the introduction of such subjects into a book on determinants is not wholly unprecedented — Mathews' revision of Scott's book containing a brief discussion of infinite determinants — it must still, in view of its extent, be regarded as an innovation. This feature of the book is to be welcomed and will doubtless be imitated by other writers of text-books on this subject.

* A few equations of higher degree (secular equation, etc.) which are intimately connected with the theory of determinants are also considered in this first part.