which is not a square; one may add to any set of postulates defining a field these two: (α) -1 is a not-square. (β) The sum of two not-squares is a not-square. On defining $a < b$ to mean that $a - b$ is a not-square, the usual propositions about the symbol $<$ follow at once. If a continuity axiom is added, the system of postulates so obtained defines the real number system. This note is to be published in the *Transactions*.

22. The third paper by Professor Dickson deals with the generalization of the concept of hypercomplex number systems and of the precise definition of this generalized concept by means of independent postulates. The elements are $a = (a_1, \cdots, a_n)$, where the a_i are marks of a given field F. A system of such elements together with n^3 fixed marks γ_{ijk} form a number system if the following six postulates hold: (1) if a and b are elements of the system then $(a_1 + b_1, \cdots, a_n + b_n)$ is also an element; (2) the element $0 = (0, \cdots, 0)$ occurs in the system; (3) if 0 occurs, then to any element a corresponds an element a' of the system such that $a_i + a_i' = 0$ $(i = 1, \cdots, n)$; (4) if a and b are any two elements, then $(p_1, \cdots, p_n)$ is an element of the system, where $p_i = \Sigma a_j b_k \gamma_{jki}$; (5) the usual relations between the γ's assuring associativity of multiplication; (6) if $\tau_1, \cdots, \tau_n$ are marks of F such that $\tau_1 a_1 + \cdots + \tau_n a_n = 0$ for every a, then $\tau_1 = 0, \cdots, \tau_n = 0$. It is shown that n units linearly independent with respect to F can be determined. The paper is to appear in the July number of the *Transactions*.

J. W. Young,
Secretary pro tem. of the Section.

Evanston, Ill.,
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A GENERAL THEOREM ON ALGEBRAIC NUMBERS.

BY PROFESSOR L. E. DICKSON.*

(Read before the American Mathematical Society, December 29, 1904.)

1. Let $r_1, \cdots, r_n$ belong to a field F and let

$$\rho^n = \sum_{i=1}^{n} r_i \rho^{n-i} \tag{1}$$

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