ABSTRACTS OF PAPERS

SUBMITTED FOR PRESENTATION TO THE SOCIETY

The following papers have been submitted to the Secretary and the Associate Secretaries of the Society for presentation at meetings of the Society. They are numbered serially throughout this volume. Cross references to them in the reports of the meetings will give the number of this volume, the number of this issue, and the serial number of the abstract.

Algebra and Theory of Numbers

145. A. T. Brauer: *A problem of additive number theory and its application in electrical engineering.*

A set S of non-negative integers is called a basis of order 2 with regard to addition for the integer n if each non-negative integer $t \leqq n$ is the sum of two elements of S. Denote by $k = k_a(n)$ the smallest number of elements in any such basis for n, and for given k by $n = n_a(k)$ the greatest number for which a basis of k elements exists. Rohrbach [Math. Zeit. vol. 42 (1937) pp. 1–30] proved Schur's conjecture that $k_a(n) = O(n^{1/2})$. Moreover he proved that $.4992\, k^2 > n_a(k) > k^2/4 + 11k/6 - 237/12$. Similarly a basis with regard to subtraction is defined. For a basis with regard to addition and subtraction Rohrbach proved that $n_{a,s} \geqq k^2/4 + k/2 - 1$. In this paper, it is proved that for every k a basis with regard to subtraction can be determined for which $n_s \geqq k^2/4 + 7k/6 - 53/12$. For the construction of a special resistance, it was of interest to determine the exact value of $k_s(30)$. It is proved in this paper that $k_s(30) = 10$. Similarly $k_s(n)$ may be determined for every given n. (Received July 19, 1945.)

146. F. L. Brown: *A simplification of the postulates of tri-operational algebra.*

The author retains the postulate $10 = 1$ (juxtaposition denoting substitution) which is independent of the other assumptions of tri-operational algebra (cf. Reports of a Mathematical Colloquium, nos. 5–6, p. 13) and introduces the postulate $0f = f$ for each f. Then the postulates concerning 0, 1, and $-f$ (that is, $0+f=f$, $1 \cdot f = f$, $f + (-f) = 0$ for each f) can be replaced by the weaker assumptions $0+j=j$, $1 \cdot j = j$, and the existence of an element n such that $j + n = 0$ where j is the neutral element with respect to substitution ($jf = fj = f$). The postulate $0f = 0$ is independent of the other assumptions. While $0f$ is never equal to 1 or j, there does exist an algebra with five elements for one of which one has $0h = h \neq 0$. One may replace $0f = 0$ by $1f = 1$ in conjunction with $01 = 0$. (Received June 23, 1945.)

147. A. H. Copeland and Paul Erdös: *Note on normal numbers.*

D. G. Champernowne proved that if all of the positive integers are expressed in the base ten and arranged in order, the resulting sequence of digits when regarded as an infinite decimal constitutes a number which is normal in the sense of Borel. He conjectured that if the sequence of all integers were replaced by the sequence of primes, the corresponding decimal would be normal. In the present paper it is proved