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

330. A. A. Albert: *Division algebras over a function field.*

Let D be a division algebra of degree m over its centrum K which is algebraic of finite degree over $L(x)$. The author studies the least degree n of fields W of finite degree over L such that a composite of K and W splits D. Clearly $n \geqq m$ and one asks whether in general $n=m$. The answer is in the negative, since if L is finite and $K=L(x)$, then n may be any integer divisible by m and such that every prime factor of n divides m. The property $n>m$ is not a function of the finiteness of L and this is indicated by proving it for $m=2$ and *all* fields L such that there exist at least two inequivalent quadratic extensions of L. In particular when L has characteristic two this result implies $n>m$ also for any $m=2^e$. The paper mentions finally an unpublished master's dissertation of Louis Gordon showing that if $m=4$ and K is algebraic of finite degree over $L(x_1, \cdots, x_r)$ then D may be non-cyclic if $r>2$ and the x_i are independent indeterminates over L. However, it is proved that D is necessarily cyclic for $r=2$. (Received July 14, 1941.)

331. A. A. Albert: *Non-associative algebras.* I.

The paper presents a new general theory of non-associative algebras. Any algebra A is a linear space L of finite order over a field. Multiplication in A is then defined by a linear mapping $x \rightarrow R_x$ of L on the space of right multiplications R_x of A. A second algebra A_0 of the same order may be regarded as consisting of the same quantities as does A but with multiplication defined by $x \rightarrow R_x^{(0)}$. Then A and A_0 are called isotopes, or isotopic algebras, if there exist non-singular linear transformations S, T, U on L such that $R_x^{(0)}=SR_yU$, $y=x^T$. Isotopy is then a widening of the concept of equivalence except in the case of associative algebras with a unity quantity where the concepts coincide. This possible widening accounts at least partly for the inordinately large number of algebras of low orders. It is shown that there exist non-commutative isotopes with a unity quantity of commutative non-associative algebras with a unity quantity, and non-simple isotopes of simple algebras. Related topics inspired by isotopy and connections of the theories of associative algebras, Lie algebras and Jordan algebras are studied. (Received July 14, 1941.)

332. Reinhold Baer: *Automorphism rings of primary abelian operator groups.*

The representation of a ring as the ring of all the automorphisms of a primary abelian operator group expresses significant inner properties of this ring, since there