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

182. Reinhold Baer: *A unified theory of projective spaces and finite abelian groups.*

It is the object of this investigation to develop in detail a theory which contains as special cases both projective geometry and the theory of finite abelian groups. The primary abelian operator groups lend themselves in quite a natural manner for this purpose. Those partially ordered sets that are exactly the systems of all the admissible subgroups of suitable primary abelian operator groups are determined, and it is shown that the group and its operators are completely determined by the system of admissible subgroups. Those questions which are fundamental in the two theories are discussed, such as the basis-theorem, the relations between dualities and bilinear forms, and so on. (Received March 12, 1941.)

183. Richard Brauer: *On the connection between the ordinary and the modular characters of groups of finite order.*

Let G be a group of finite order $g=p^a g'$, where p is a fixed prime and $(p, g')=1$. If $\mathfrak{Z}$ is a character of G, then for every element A of an order prime to p the value $\mathfrak{Z}(A)$ is a linear combination of the modular group characters of G. The coefficients are rational integers, the decomposition numbers of G. In this paper it is shown that the value $\mathfrak{Z}(A)$ of $\mathfrak{Z}$ for elements A of an order divisible by p can be expressed by means of the modular characters of certain subgroups N_i of G. The matrix Z of all ordinary group characters of G then appears as a product DX of two square matrics. The matrix X contains in its rows the values of the modular characters of G and of the N_i while the coefficients of D are integers of the field of the p^ath roots of unity. A number of properties of the coefficients of D are given. (Received March 18, 1941.)

184. R. H. Bruck and T. L. Wade: *Bisymmetric tensor algebra.* I.

This paper lays a basis for a study of the linear associative algebra of bisymmetric tensors (H. Weyl, *The Classical Groups*, p. 98) which gives a realization of a semi-simple algebra. The ordered product of two tensors $A^{(i)}_{(j)}$ and $B^{(i)}_{(j)}$ is defined by $A^{(i)}_{(m)}B^{(m)}_{(j)}=C^{(i)}_{(j)}$, where $(i)=i_1\cdots i_p$. The unit tensor $\delta^{(i)}_{(j)}=\delta^{i_1}_{j_1}\cdots\delta^{i_p}_{j_p}$ may be decomposed into a direct sum of immanent tensors (T. L. Wade, abstract 47-1-10). For a tensor $A^{(i)}_{(j)}$, a determinant, adjoint, and inverse are defined with the aid of a tensor $\delta^{(i_1)\cdots(i_N)}_{(j_1)\cdots(j_N)}$ which constitutes a further generalization of the familiar generalized Kronecker delta; here $N=n^p$. Also the concepts of rank and of rank tensor are introduced. Explicit algebraic construction is given of the factors of the determinant in the