ABSTRACTS OF PAPERS

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

1. I. S. Cohen: *Some theorems on local rings.*

Let $\Re$ be a p-series ring (as defined by Krull, J. Reine Angew. Math. vol. 179 (1938) p. 205); let n be its dimension. It is shown that if $\mathfrak{a}$ is an ideal in $\Re$ having a basis of r elements and of dimension at most $n-r$, than $\mathfrak{a}$ is unmixed, of dimension $n-r$. This is a generalization of a well known theorem of Macaulay. If $\Re$ is complete and if $\mathfrak{S}$ is a p-series ring integrally dependent on $\Re$, then the rank of $\mathfrak{S}$ over $\Re$ is equal to the ramification order of $\mathfrak{S}$ with respect to $\Re$ (defined as the length of the primary ideal obtained by extending to $\mathfrak{S}$ the maximal ideal of $\Re$) multiplied by the degree of the residue field of $\mathfrak{S}$ over that of $\Re$. These results depend on the following theorem concerning the structure of a complete p-series ring: If the characteristics of $\Re$ and its residue field are the same, then $\Re$ is a power series ring over this field; if the characteristics are different, then under a simple additional hypothesis, $\Re$ is a power series ring over a complete discrete valuation ring. It is also shown that every complete local ring is a homomorphic map of a ring of one of these two types. (Received November 24, 1942.)

2. Franklin Haimo: *Periodic functions on algebraic systems.*

A single-valued function F over a group G is said to have a period p if $F(xpy) = F(xy)$ for every x and y in G. The periods of F form a normal subgroup of G. All single-valued functions over G with range in a class C are at least trivially periodic and are partitioned into classes each containing one and only one distinct homomorphism of G. Single-valued functions over a quasi-field H may have periods which are both additive and multiplicative. Such periods form a normal subgroup of the multiplicative group of H. Single-valued functions over lattices may have join-periods and meet-periods. Meet-periods form a join-ideal and dually; while non-constant single-valued functions over Boolean algebras have no members which are both join- and meet-periods. (Received November 23, 1942.)

3. P. R. Halmos: *On automorphisms of compact groups.* I.

If T is a continuous automorphism of a compact abelian group G then, because of the uniqueness of Haar measure, T is a measure preserving transformation. T is ergodic (in fact strongly mixing) if and only if the adjoint automorphism T^* of the character group G^* has no finite orbits. If an automorphism (such as T^*) of a discrete abelian group has no finite orbits then it has an infinite number of orbits. It follows