ABSTRACTS OF PAPERS

SUBMITTED FOR PRESENTATION TO THIS 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.†

1. Dr. A. A. Albert: *The structure of pure Riemann matrices with non-commutative multiplication algebras.*

The chief outstanding problem in the theory of Riemann matrices is the determination of the structure of all pure Riemann matrices ω with a given non-commutative division algebra B as multiplication algebra D. The problem is here reduced essentially to the case where B is a normal division algebra. We consider in detail the case where B is a known normal division algebra, that is, an algebra in n^2 units and of type R_n. In that case we find not only the structure of ω but that of its principal matrix, and obtain necessary and sufficient conditions on D that it be a multiplication algebra of some ω, and the form of the ω in terms of a single arbitrary submatrix. The theory is applied to the cases of generalized quaternion algebras, generalized quaternion algebras over a quadratic field, and to Cecioni algebras. In the first two cases actual classes of numerical examples of Riemann matrices are given, these being the first known examples of Riemann matrices with non-commutative division multiplication algebras.

2. Dr. A. A. Albert: *A construction of rational cyclic division algebras of order sixteen.*

As is known, all normal division algebras in sixteen units are Cecioni algebras. However, the only algebras of order sixteen which have been constructed are the few isolated algebras of Cecioni. We consider here

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* In the future, abstracts of papers will appear under the heading given above, separately from the reports of meetings, as explained in the announcement of pages 1–2 of this issue. Eventually, many abstracts will be printed in advance of the meeting at which the corresponding paper is presented, but this will not be done until the abstracts of papers that have been read have been printed.

† Thus, if an abstract numbered 238 is printed in issue No. 5 of volume 36, the cross-reference will be (Abstract No. 36-5-238).