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.

256. Professor C. M. Cramlet: *Linear differential equations with constant coefficients.*

First order differential equations are solved by reducing the equations to canonical form by elementary matrix operations. The method is elementary and practical for the solution of the homogeneous and non-homogeneous systems. (Received May 7, 1936.)

257. Professor C. M. Cramlet: *On the reduction of a representation to classical canonical form.*

A representation or mixed tensor a_s^i transforms in accordance with the matrix equations $\bar{a}=paq$, $pq=1$. The transformation matrix p such that a is transformed to canonical form $\bar{a}$ is found by simultaneously choosing p_i and q_i as elementary matrices, transforming a to canonical form by a succession of transformations. The method is practical for the reduction of a numerical matrix a. (Received May 7, 1936.)

258. Professor H. P. Robertson: *Geometry and physical space-time.*

There are two roles which geometry, or its four-dimensional extension, kinematics, may assume in physical science: (1) an *a priori* form, prerequisite to a quantitative description of the physical world, and (2), a *contingent* form, conditioned by the physical content of space-time. The following topics are treated: Influence on the former position, as exemplified by Newton and Kant, of the classical non-euclidean geometries of Gauss, Bolyai, Lobachévski, and Riemann; mathematical and philosophical development of this view by Helmholtz, Lie, and Russell. Extension to the four-dimensional space-time manifold in the special theory of relativity by Einstein and Minkowski, and in the later theories of de Sitter, Whitehead, and Milne. Development of the second position, envisaged by Riemann, in the general theory of relativity, by Einstein and Weyl; applications to cosmology by Friedmann, Lamaître, Tolman, and the author. Interfusion of the second position with the methods of the first in the cosmological applications of the author's kinematical investigations, and