

THE COLLECTED WORKS OF MILLER

The Collected Works of George Abram Miller. Vol. 2. By H. R. Brahana, R. D. Carmichael and A. B. Coble, The Committee on Publication, University of Illinois Press, 1938. 11+537 pp.

This volume reproduces one hundred seven papers published by Miller during the years from 1900 through 1907. It also contains two papers written by him especially for this volume. One of these (No. 63) is entitled "Note on the History of Group Theory during the Period Covered by this Volume"; the other (No. 171) is entitled "Primary Facts on the History of Mathematics." The second of these was included at Miller's request. In an appendix there are listed the titles of forty other papers written by him during the period; some of these are covered by papers included and the others are concerned with history, elementary illustrations, applications, or expositions. A subject index and a name index prepared by Miller are also included.

The paper entitled "Note on the History of Group Theory during the Period Covered by this Volume," like the three historical notes written for Volume I, gives a good survey of those developments which are closely related to Miller's work. In 1898 Miller published his first report on recent progress in the theory of groups of a finite order. Second and third reports on the same subject were published by him in 1902 and 1907 respectively. The second report (No. 89 in this volume) is devoted chiefly to recent advances in abstract groups, holomorphisms, substitution groups, and group characteristics, and the third (No. 153) is devoted to elementary applications, abstract groups, groups of isomorphisms, and substitution groups. These reports along with the historical papers just mentioned trace in a satisfactory way the development of the theory of groups up to 1908 and afford a splendid basis for the appreciation of the work done in this field up to this time by Professor Miller. Another paper (No. 64) is entitled "Report on Groups of an Infinite Order." In this paper considerable attention is given to a memoir on groups of movements written by Jordan in 1868 and brief accounts are given of the work done by Lie, Klein, Dyck and others; this paper supplements the reports on groups of a finite order.

To present the nature of the work contained in the 104 papers reproduced in this volume and not mentioned above, it will be convenient to consider them under the headings: (1) Papers on the determination of groups of finite order, (2) Papers which deal with the theory of groups, (3) Papers on group theory and number theory, (4), Reviews; elementary and expository papers; applications. These will be considered in order.

(1) *Papers on the Determination of Groups of Finite Order.*

These papers will be considered under the subheadings (a) Groups of given degree or order, (b) Groups containing given subgroups, (c) Groups having given defining relations, (d) Groups having given groups of isomorphisms.

(a) *Groups of given degree or order.* The papers in Volume I on the determination of groups of finite order are concerned chiefly with permutation groups of given degree and abstract groups of given order. In Volume II there are only five such papers. In one of these (written with G. H. I.ing) a complete determination is made of the intransitive substitution groups of degree eleven. In another, all the abstract