

MILLER'S COLLECTED WORKS

The Collected Works of G. A. Miller. By H. R. Brahana, R. D. Carmichael, and A. B. Coble (the committee on publication), and G. A. Miller. University of Illinois Press. Volume 1, 1935. xi+475 pp.

In the preface written by the committee on publication, consisting of H. R. Brahana, R. D. Carmichael, and A. B. Coble, of the University of Illinois, it is stated that "the preparation of this volume is almost wholly the work of Professor Miller." This volume contains Miller's contributions up to the year 1900 together with three papers (numbered 1, 15, 62) written for the purpose of showing the place of this work in the theory and to give a brief survey of the historical development of the subject up to 1900.

The papers in this volume with exception of 1, 15, and 62, are arranged substantially in the order in which they were published, but for the purpose of exhibiting the nature of the work contained in them it will be convenient to group them under the following headings: (1) Papers which relate to the determination of groups of finite order. (2) Expository papers on the construction of permutation groups; applications. (3) Papers which deal with the theory of groups of finite order. (4) Paper on recent progress; miscellaneous papers. These will be considered in the order given.

(1) *Papers which relate to the determination of groups of finite order.*

These are as follows: (a) Permutation groups of given degree; (b) Abstract groups of given order; and (c) Non-regular permutation groups of given order.

(a) *Permutation groups of given degree.*

To give a proper introduction and setting to his early papers on the listing of permutation groups of given degrees, Miller has written a special paper (numbered 1) entitled *Historical note on the determination of all permutation groups of low degrees*. In this paper there is given a clear account of enumerations made by earlier writers along with a brief statement of the methods used.

Including the historical note just mentioned there are fifteen papers devoted to the listing of permutation groups of given degrees. The most important of these papers are devoted to the determination of all permutation groups through degree ten, to the determination of all transitive groups of degrees twelve, thirteen, and fourteen, and to the finding of all primitive groups of degrees fifteen, sixteen, and seventeen. Lists of the intransitive groups of degree ten and of the imprimitive groups of degrees thirteen and fourteen were first published by Miller. Other papers are concerned with the correction of errors in lists published by earlier writers. Errors were found in all degrees from eight to seventeen, inclusive, with the exception of degrees eleven, thirteen, and fourteen. To find these errors it was necessary to make complete lists for all degrees examined by earlier writers, and in the early stages when the theory upon which this work is based was not far developed, this involved a considerable amount of tentative work. Later determinations, which were based wholly or in large part on theory, show that his earlier com-