

Other papers have implications connected with the mathematics of computation, as would be expected in any current book on large systems. Thus in the Foreword, Simon Ramo remarks that "it could be said that systems engineering in today's sense became possible only with the introduction of the large digital computer." However, the papers in this volume contribute few direct suggestions concerning this use, and concern themselves largely with other general and specific aspects of systems engineering.

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**26 [Z].**—DANIEL D. McCracken, *A Guide to FORTRAN Programming*, John Wiley & Sons, Inc., New York, 1961, viii + 88 p., 28 cm. Price \$2.95.

The usefulness of Fortran as an automatic programming system available on many different computers has prompted Dr. McCracken to publish this guide. It is addressed to people who have no programming experience but have a requirement to accomplish scientific computation or wish to get some appreciation of how this can be done.

The guide is developed pedagogically, with numerous examples, and includes a set of detailed case studies which provide examples from several fields of effort. These case studies illustrate the essential features of Fortran and suggest the range of its applicability.

An appendix summarizes the characteristics of a number of Fortran systems that have been established for different computers.

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**27 [Z].**—FRANCIS J. MURRAY, *Mathematical Machines*, Vol. 1 and 2, Columbia University Press, New York, 1961. V. 1, vii + 300 p., 26 cm. Price \$12.50. V. 2, vii + 365 p., 26 cm. Price \$17.50.

Volume one of Professor Murray's two-volume work on mathematical machines, is concerned with digital computers. There are two parts in Volume 1: part I on desk calculators and punched card machines, and part II on automatic sequence digital calculators. These digital devices are presented in the order of increasing competence and complexity.

In part I, there are eight chapters. The first four chapters describe desk calculators, from the basic idea of register and counter to the description of many commercial automatic calculators. Chapter 5 covers electrical counters and accumulators. Punched card machines are presented in Chapters 6 and 7, and sequence calculators such as calculating punch and electronic calculator in Chapter 8.

Part II consists of ten chapters. The first four chapters describe the logic aspect of the computer as well as digital arithmetic. Chapter 5 is a general discussion on the use of Boolean analysis. Chapter 6 is concerned with circuit elements. The programming aspects are covered in Chapters 7, 8, and 9. Chapter 10 is a very brief survey of digital computers.