numerical applications of computers, but, because it is so short, leaves the reader wishing the author had devoted more space to this subject. This reader would have preferred to have the author do this and omit some of his pronouncements on government (for example, the discussion on page 20 beginning with "Democratic government, too, is an example of Man in decay, . . .").

There are a few typographical errors in the book. The most disturbing one appears on page 36 where the binary addition table has the entry

$$1 + 1 = 1 \text{ (carry 1).}$$

<div align="right">A. H. T.</div>

60[Z].—ROBERT H. GREGORY & RICHARD L. VAN HORN, *Automatic Data-Processing Systems*, Wadsworth Publishing Co., San Francisco, 1960, xii + 705 p., 23 cm. Price $11.65.

This introductory book on automatic data-processing systems (ADPS) is a revision of a text which was used in management development courses sponsored by the Army Ordnance Corps. The affirmative objective is to instruct, enlighten, and inform management on the developments, techniques and applications of methods in management science, mathematics, and large-scale computing for the solution of today's complex business problems.

The book is divided into seven parts and three appendices. In Part One, "Orientation," the principles of basic computer programming are elucidated by means of a hypothetical computer which embodies an instruction repertoire of several existing machines. Various numerical and alphanumerical coding systems for storing data on punched cards, punched paper tapes, and magnetic tapes are also discussed here.

Part Two, "Automatic Equipment," deals with input-output hardware, storage devices, arithmetic and control units. The section concludes with a synopsis of the salient characteristics of approximately twenty computing systems: speed, storage, instruction repertoires, tapes, and peripheral equipment.

Advanced programming techniques and systems provide the subject matter of Part Three, "Programming and Processing Procedures." In this section the authors present a synthesis of the pros and cons of automatic programming and integrated data processing, two important and topical subjects.

The role of the data-processing unit in "management information systems" is the theme of Part Four, "Principles of Processing Systems." Several methods are suggested for selecting from a welter of available facts the pertinent information for effective executive decision-making. The reporting-by-exception principle is described in detail. Since the efficacy of the final system design is inextricably related to economic considerations, the authors analyze the major factors for determining the cost of obtaining and processing data, and explore the concept of the "value" of information in relation to its cost. The last chapter in Part Four outlines the broad principles underlying systems analysis and design.

Factors that affect the organizational structure of data processing are subject to examination in Part Five, "Systems Design." In particular, considerable attention is devoted to problems associated with centralized data processing and decentralized

management control. General tools for systems analysis and specific data-processing techniques are also described here.

Part Six, "Equipment Acquisition and Utilization," presents in a nontechnical manner a methodical approach for evaluating, selecting, installing, and implementing automatic data-processing systems for business problems. Considerable space is devoted to the preparation of feasibility studies, application studies, and equipment acquisition proposals. This is followed by a detailed discussion of the problems entailed in the installation of new equipment.

The concluding portion, Part Seven, "System Re-examination and Prospective Developments," touches on a variety of mathematical techniques for the solution of management problems and concludes with a discussion on anticipated future developments in automatic data processing.

Three appendices are:
 I. History of Computation and Data-Processing Devices
 II. Questions and Problems
 III. Glossary of Automatic Data-Processing Terminology

Although the treatment of the basic principles of computer programming illuminates many of the complex and important aspects of business data processing, the authors give little heed to the practical requirements for large-scale production system runs. Such concepts and techniques as rerun procedures, interior tape labels, alternation of servos, and programming methods for effective utilization of buffering are not even mentioned, while the subjects of editing, flow charting of instruction routines, and sorting techniques for large tape files are glossed over. But on the whole, the informative and lucid presentation of the general principles of automatic data processing from the standpoint of business systems will provide management personnel with a short, intensive, and enlightened education on electronic computers and their impact on business data processing.

MILTON SIEGEL

Applied Mathematics Laboratory
David Taylor Model Basin
Washington 7, D. C.

61[Z].—ANTHONY G. OETTINGER, *Automatic Language Translation*, Harvard University Press, Cambridge, 1960, xix + 380 p., 24 cm. Price $10.00.

Automatic Language Translation by Anthony G. Oettinger is the eighth in a series of Harvard Monographs in Applied Science. "These monographs are devoted primarily to reports of University research in the applied physical sciences, with special emphasis on topics that involve intellectual borrowing among the academic disciplines." Professor Oettinger's monograph is devoted to the lexical and technical aspects of automatic language translation, with particular emphasis on Russian-to-English translation.

The contents of this work can quickly be conveyed by the titles of its chapters. Chapter 1, "Automatic Information-Processing Machines," discusses the organization, elements of programming, and the characteristics of information-storage media. Chapter 2, "The Structure of Signs," differentiates the notions of use, mention, and representation of signs; mathematical transformations; and mathematical models. Chapter 3, "Flow Charts and Automatic Coding," treats the use of flow