The book is divided into nine sections and forty-two chapters. The section titles are: Methods of Computation, Symbolic Logic, Mechanization of Logic, Mechanization of Storage, Timing, Mechanization of Arithmetic, Control, Communication with the Computer, Preparation of Instructions, Reduction of Errors, and Present Trends.

The author has placed more emphasis on symbolic logic than on any other subject. This section of the book begins with Boolean algebra and terminates with a discussion of the Harvard Minimizing Chart. However, even in this section, the best written one in the book, the author does not develop the mathematical ideas involved adequately or prove statements. He describes various facts and illustrates the use of various techniques.

The author does not go very far in the discussion of any topic he selects, and he omits many significant points in his discussion. Some omissions are noted in footnotes but some are never mentioned. For example, "asynchronous machines" are dismissed with a footnote on page 145. The words "round-off" and "rounded multiplication" are never mentioned in the text and neither word can be found in the index. The existence of a computer using a number representation other than one with a signed absolute value is never mentioned.

It is unfortunate that the author did not see fit to include in the bibliography references to the reports by von Neumann and his co-workers at the Institute for Advanced Study. The discussion given in these reports of arithmetic performed in a computer with a two's complement representation of numbers is clear and complete, and would supplement very nicely the author's limited discussion of arithmetic in a binary machine.

A. H. T.

31[Z].—T. E. IVALL, *Electronic Computers, Principles and Applications*, Second Edition, Philosophical Library, New York, 1960, viii + 263 p., 22 cm. Price $15.00.

This is a revised version of the first edition published in 1956 under the same title [1]. In the first edition the author acts as an editor, publishing in book form the separate contributions of a number of English writers working in the field of computers. In the present edition the author attempts to regroup and rewrite the material so as to present a more coherent picture. He also adds three short chapters, as follows:

(1) In place of one chapter on Analogue Computing Circuits the new edition now contains two chapters, Analogue Computing Circuits—1, and Analogue Computing Circuits—2.

(2) A chapter on Programming Digital Computers is added.

(3) The chapter, Computers of the Future, somewhat rewritten, now becomes Recent Developments, and a new chapter, Computers of the Future, is added.

The book is intended as an introduction to the computer field for the non-technical reader. It can adequately fulfill this purpose. However, the book has a number of deficiencies. It also appears that the author has not really kept abreast with modern developments in this field, nor with the rapid advances which are taking place in this country. In his brief chapter, Computers of the Future, he discusses mainly some future potential applications of computers rather than the exciting developments which are taking place in the field of computer design. He sometimes betrays

a rather limited appreciation of the flexibility and power of modern digital computers. For instance, on page 214 he states: "It now appears that digital computers, too, may have some applications in the field of simulation, particularly when the system to be simulated has a digital nature." Digital computers have for years been used to simulate very complex physical systems, for example, the temperature distribution within the core of a nuclear reactor.

This book can serve as a simple and not too technical introduction to computers. In the opinion of the reviewer, however, the interested reader can find a number of other books recently published that will more adequately serve this purpose, and probably at a lower price.

H. P.

1. T. E. IVALL, Editor, *Electronic Computers*, Philosophical Library, New York, RMT 118, *MTAC*, v. 12, 1958, p. 255.

32[Z].—WALTER J. KARPLUS, *Analog Simulation, Solution of Field Problems*, McGraw-Hill, New York, 1958, xv + 434 p., 23 cm. Price $10.00.

Analog Simulation by Karplus is essentially unique. There are neither competitive contemporary treatises nor older works with which to compare it in review. It almost automatically, then, belongs in any complete library of machine computation. The real question, on the other hand, is whether a real need exists for either a text or a reference book on its subject matter. As a research engineer, the reviewer has a strong affirmative answer to the second half of this question. He can now throw away the collection of reprints and notes which he has been carrying around for years. Its merit as a text is more debatable.

The subject matter of the book should be made clear first. The title, *Analog Simulation*, conveys to most American engineers devices like aircraft and missile simulators and electronic amplifier differential analyzers. Even the subtitle, "Solution of Field Problems," evokes a momentary picture of a fire control computer in the "field." The full title is correctly descriptive of the category of physical problems considered, but a title like "Analog Techniques for Partial Differential Equations" would have made the material covered more readily apparent.

The book is divided into three major parts. Part 1 (Chapters 2–4) gives 98 pages of mathematical background for analog study of field problems. In Part 2 (Chapters 5–10), the actual "hardware" is discussed in 165 pages. Part 3 returns to a mathematically organized discussion of the applications of the previously discussed analog techniques to different classes of partial differential equations (Chapters 11–14, 115 pages). It may be seen that most of the book is problem-oriented.

In spite of this problem orientation, the book is highly recommended as a reference on analog techniques. This is in large part a consequence of the superb list of references at the end of each chapter and the excellent 22-page general bibliography. The only serious omission is *Dynamical Analogies* by H. F. Olson, the closest equivalent to Karplus, although almost solely concerned with acoustics and vibration. If for no other reason, it would be recommended for a place on the engineer's bookshelf alongside good source books on digital computers and electronic differential analyzers.