The author has adopted the hardware conventions associated with the machine (GIER) with which he is most familiar; furthermore, he devotes one chapter to certain additions to ALGOL which increase the efficiency of the programs produced by the GIER compiler. The instructor who uses this book as a text may well wish to make certain modifications concerning these points. He may also wish to place slightly more emphasis upon such matters as conditional statements in arithmetic expressions—which are relegated to an appendix, on recursive procedures—to which only fleeting reference is made, and to own variables which are dealt with not at all.

There are a few typographical errors (for example on page 3 two signs, $\neq$ and $=$, should be interchanged, and on page 53 there is a redundant open bracket), though mistakes of this nature occurring in the ALGOL texts will doubtless either be recognized by anomalous functioning of the program or be picked up by the ALGOL monitor.

The publishers are to be congratulated on their enlightenment in offering this book at such a moderate price.

PETER WYNN

Mathematics Research Center
University of Wisconsin
Madison, Wisconsin

64[Z].—KARL-HEINZ BÖHLING, *Zur Strukturtheorie sequentieller Automaten*, Forschungsberichte des Landes Nordrhein-Westfalen, No. 1279, Westdeutscher Verlag, Opladen, 1964, 73 pp., 23 cm. Price DM 45. (Paperback)

The author defines a *sequential system* as a triple $\langle \epsilon, G, F \rangle$, where ϵ is the union of disjoint sets θ (comprising input and output alphabets) and S (the set of states), and where $G \subseteq \theta \times S \times S$ and $F \subseteq \theta \times S \times \theta$ are ternary relations on ϵ corresponding, respectively, to the transition and output functions of a conventional deterministic sequential machine. The apparent purpose of this monograph is to show that sequential systems are sufficiently general to embrace all of the principle models current in automata theory, including incompletely specified machines, nondeterministic machines, Rabin-Scott machines, and abstract (Ginsburg) machines among others—a conclusion that is hardly surprising. Aside from this, a tedious attempt is made to develop a formalism for distinguishing among the various types of machines, considered as sequential systems.

As the author grants in his introduction, no attempt is made to generalize, unify, or even present the existing theories, though he promises to deduce some consequences in a subsequent publication. At least until this program is carried out and the sequential system is shown to be a fruitful generalization, one must regard the present work as virtually useless, either as a text or a reference book.

J. C. BEATTY

IBM Research Center
Yorktown Heights, New York

65[Z].—ROY DUBISCH, *Lattices to Logic*, Blaisdell Publishing Co., New York, 1964, vii + 88 pp., 20 cm. Paperback. Price $1.65.

This treatment of lattices, sets, switching circuits and logic is written primarily for mathematical beginners. Partially ordered systems and lattices are introduced

through Hasse diagrams of assorted shapes and structures, but after this general introduction, except in one short chapter on convex sets, attention centers chiefly on Boolean algebras. It is shown through examples that the equalities of set theory have analogues in the equivalences of switching circuits and of propositional logic. The discussion proceeds at the notational level, no attempt being made to locate the source of the analogies. Numerous exercises are included, along with complete solutions.

There are some errors. To correct these, it should be pointed out to prospective young readers that (p. 23) not all lattices have universal elements, that (p. 46) the second illustrative example on switching circuits is incorrectly worked out, that (pp. 58–59) the remarks and usages concerning logical and material implication are misleading, that (p. 59) the exercise in which the reader is asked to prove that a conditional statement is logically equivalent to its converse contains an unfortunate misprint, and that (p. 60) C. S. Peirce's name is repeatedly misspelled.

GEORGE N. RANEY

University of Connecticut
Storrs, Connecticut

66[Z].—L. I. GUTENMAKHER, *Electronic Information-Logic Machines*, John Wiley & Sons, Inc., New York, 1963, x + 170 pp., 23 cm. Price $8.00.

The term "information-logic machines" describes systems capable of dealing with data presented in written form. These machines are considered to be able to perceive, to store, and to manipulate such data. Their purpose is to mechanize much of the intellectual work of mankind, just as earlier machines reduced the need for man to perform physical labor.

Electronic Information-Logic Machines contains, basically, two kinds of material; on the one hand, concise and practical descriptions of hardware implementations in use today; on the other, some preliminary calculations and speculation as to the work such machines may eventually be expected to perform.

Professor Gutenmakher intends for his systems to go well beyond what is normally understood by "information retrieval." For example, it would be possible to store the 100,000,000 or so titles thus far accumulated by man, and, then, by clever programming, by "specialized algorithms," to synthesize new information from the old.

In Chapter 6 he discusses at great length the problems in indexing, classifying, and translating to a common *machine-oriented* language the literature in the physical sciences. Again, he does not stop there but continues on to show how his information-logic machine will propose ways to, say, synthesize new substances based on what is stored in the chemistry literature. The machine will, in effect, be "teaching" and "self-instructing" in the sense of up-dating its stored files with results of experiments run to confirm its "suggestions." [On p. 156 the translators appear to be carried away by Professor Gutenmakher's futuristic mechanical brain and have it do its own experimental testing as well!]

In summary, Professor Gutenmakher is highly informative in his discussions of hardware and in the calculations to justify the future use of "info-logic" machines; and also quite entertaining in the "scientific science-fiction" approach to the ulti-