tainly not in so general a form, before the work of the author. For this reason it is not a book that can be skimmed lightly, but rather it must be studied to be followed. The organization, however, is good and the proofs clearly written, their length in many instances being due to the extremely weak assumptions made. It must certainly be counted an important addition to the literature and will deserve the careful consideration of mathematicians interested in the geometry of Riemannian and, particularly, Finsler spaces.

WILLIAM M. BOOTHBY

Structure of a group and the structure of its lattice of subgroups. By Michio Suzuki. (Ergebnisse der Mathematik und ihrer Grenzgebiete. Neue Folge. Heft 10.) Berlin, Springer, 1956. 6+96 pp. DM 16.50.

The lattice of subgroups of a given group has been studied for a long time, even before lattice theory was recognized or named. The converse problem—what can be told about a group from knowledge of its lattice of subgroups—was first studied by Ada Rottländer in 1928, followed in the next few years by R. Baer and O. Ore. In the past fifteen years much more has been learned, through the efforts of a number of mathematicians including the author. The present monograph is the first collected presentation of this work. The author thoroughly surveys the known facts, rounding them out with additional results not previously published. Substantial familiarity with groups and lattices is assumed; thereafter the presentation is self-contained except for the omission of proofs or details (for which references are given) in the advanced stages of some developments.

Chapter I discusses groups which have special kinds of lattices of subgroups, such as distributive, modular, etc. In this respect, knowledge seems relatively weak in the case of complemented lattices. Chapter II considers the case of two groups G and H whose lattices of subgroups are isomorphic; then the author calls H a projectivity of G (more commonly G and H have been called lattice-isomorphic or structurally-isomorphic). This situation has been essentially completely characterized for finite groups, and largely so in the infinite case. One might add to the bibliography the recent paper of B. Jónsson [Mathematica Scandinavica, vol. 1 (1953) pp. 193–206]. Chapter III presents analogous results for lattice-homomorphic groups; for most of these results it is required that the homomorphism be complete (i.e., hold even for infinite joins and meets). Chapter IV considers cases where the lattices of subgroups are dually-isomorphic.

It is impressive to see how much is known about these matters as

a whole, although the author points out substantial unsolved questions. This comprehensive view is aided by the very readable exposition. The book is recommended to all readers interested in the subject.

PHILIP M. WHITMAN

The world of mathematics. A small library of the literature of mathematics from A'h-mosé the Scribe to Albert Einstein, presented with commentaries and notes by James R. Newman. New York, Simon and Schuster, 1956. 18+2537 pp., 4 volumes. $20.00.

While it is not customary to review popular books on mathematics in this Bulletin, this one so far exceeds the norm both in range and in sales that it demands notice. (It is undoubtedly the all-time best-seller among mathematics books other than textbooks.) A nonmathematician with an amateur's interest in the subject might well wonder at first why he should buy these volumes rather than one of the more compact (and less expensive) popular books, of which there are many excellent ones that have enjoyed a far smaller sale. However, most short popular books on mathematics cover only a limited selection of topics that are not too technical to discuss superficially and are conceded to possess universal appeal. Most of these topics are included here too, but so is much more, and the reader can make his own choice. The subtitle is in a sense misleading, since the contents are much more literature *about* mathematics than mathematics as such. This is of course inevitable in any popular book. A nonmathematician will not learn much mathematics from these volumes, although he is told a great deal about mathematics and about cognate subjects, such as mathematicians, physics, logic, and foreign politics; whether this will help him understand what mathematics is about and what mathematicians do is not for a professional mathematician to say. However, there is also a great deal here of value for the professional mathematician, collected from sources that are not on everyone's bookshelf. Some at least of this material will be helpful to teachers, and it would be hard to find any mathematician who will not be entertained by some of it, or who will not find something that is new to him.

The contents are highly varied. Some of the selections are actually from the mathematical literature in the strict sense, some are written specifically for the layman, and some are mathematics only by the editor's fiat. Some are extremely interesting, some are exasperating, and some are downright dull. It would be neither practical nor illuminating to list the contents in detail: the following remarks are indicative rather than exhaustive. There are numerous assorted dis-