cause the institutional and legal framework for governing water development was inadequate to prevent the serious problems that now confront the state. In addition, basic data and hydrologic investigations were, and are, insufficient in scope and quantity to forecast, in any satisfactory way, the consequences of various alternative actions that might have been taken.

Mann's book is concerned primarily with the history and status of these administrative and legal results as they are affected by the desires and the consequent pressures of various parts of the total community. But, in addition, the author explains the programs, philosophies, and plans of the various state and federal bureaus whose work impinges on water questions. The politics of the situation are explained in discussing the history that has led to the present situation; but in some respects the title is a little misleading, for the present political attitudes and pressures are not explained with the same force and clarity used in describing the sequence of events in the past. This difference between the explanation of past events and the present situation is understandable, but some of the more interesting intricacies of the present political framework are perforce side-stepped by the author. This can also be seen in the discussion of the attitudes and policies of the state and federal bureaus, the description of which comprises nearly half of the volume.

On the whole, however, Mann is amazingly forthright. In dealing with a situation as complicated as the one that exists in Arizona, no author can be completely forthright and still maintain objectivity; many interpretations of present attitudes and policies could be made, but they depend on the point of view of the observer.

In view of the fact that this is the first book to deal with the politics of water, it is an extremely informative and a highly commendable venture, one that other States should emulate, for such books are much needed to educate the public about water problems. The author conveys to the reader a considerable insight into these complicated matters but nevertheless leaves him with a feeling that this is an objective analysis which attempts to present various points of view in as fair a light as possible. The book is highly recommended to all persons interested in water problems, both administrative personnel and scientific hydrologists, as well as to community groups interested in the use and development of resources.

It is obvious that a book of this kind cannot be completely up to date, for events proceed apace even while it is being written. However, it is quite distracting to find that portions of the book are up-to-date with respect to the Supreme Court decision on the California-Arizona suit [373 U.S. **546** (1963) Ariz. vs. Calif.], which was concerned with the use of Colorado River water, but that other parts of the book, which deal with the same subject, are not. It would have been better to present the situation as it was before the Supreme Court decision was rendered, or to rewrite the book uniformly so that all portions of the volume reflect the Court decision.

LUNA B. LEOPOLD
U.S. Geological Survey, Washington, D.C.

Mathematical Surveys, No. 9

Linear Approximation. Arthur Sard. American Mathematical Society, Providence, R.I., 1963. xii + 544 pp. Illus. $16.80.

The theory of approximation discusses the problem of finding, for a given complicated function $f(x)$, a simple function $P(x)$, which can replace $f(x)$ with a small error. In the simplest case, $f(x)$ is a continuous function for $a \leq x \leq b$, while $P(x)$ is an algebraic or a trigometric polynominal of degree n. Originally approximation was identical with interpolation, but it became an independent discipline after Chebyshev (1958) and Weierstrass (1885) found their fundamental results about approximation by polynomials. At first only approximation of individual functions was studied, but the introduction of electronic computers was in part responsible for a change in attitudes. In present-day computation, one often has to deal with a great number of functions at the same time. It is then not possible or profitable to pay attention to the individual features that some of them may possess. Thus, mathematicians were led to the study of approximation questions for large classes of functions. For this purpose, Kolmogorov successfully introduced the notions of width and of entropy of sets of functions.

Where does the Sard's book fit into this development? In his monograph, Sard presents in great detail the results of his research. They lie on the borderline between theoretical and practical approximation. One of Sard's purposes is to find the "best" approximation formulas. His main idea is to come back to interpolation, but with fewer restraints than in the classical formulas. The error is a linear functional which contains some free parameters. Sard minimizes its norm in a certain Hilbert space. This gives the parameters and the approximation itself. The result is best for a class, not for individual functions. Many formulas are thus obtained; their connection with spline interpolation (de Boor, Schoenberg) was discovered only recently and, thus, could not be included.

The second part of the book deals with functions of several variables. Sard is able to avoid some of the difficulties inherent in the problem by adopting spaces of functions for which the different data (the partial derivatives involved) are in a certain sense independent. A further major part of the book presents the probabilistic theory of Wiener-Kolmogorov, augmented by Sard's own results. The practical usefulness and theoretical interest of Sard's formulas are clear.

G. G. LORENTZ
Department of Mathematics, Syracuse University

Mathematics

Homology. Saunders MacLane. Springer, Berlin; Academic Press, New York, 1963. x + 422 pp. Illus. $15.50.

Here is a masterly, comprehensive treatment of an exciting area in contemporary mathematics. From the most primitive, intuitive ideas of "boundary," there has evolved in the past 70 years a sophisticated mathematical machinery called "homology." Like the differential calculus, homology arose as a collection of techniques, later strengthened and enlarged by an intensive study of the underlying theory. The present book offers the reader a working knowledge of homology—in theory, in practice, and in relation to many other branches of mathematics.

The author covers this wide range of material thoroughly, bringing out the local color of the various fields he traverses. Algebraic structures are his raw materials; categories and functors