BOOK REVIEWS

Topics in topology. By Solomon Lefschetz. (Annals of Mathematics Studies, no. 10.) Princeton University Press, 1942. 139 pp. $2 00.

This book is a companion volume to the author's recently published *Algebraic Topology*. In the latter volume the interest is focused, as the title implies, on the algebraic structure and properties of complexes and on their applications to the study of abstract spaces. Here, however, the interest lies in the topological structure of complexes and related spaces. Indeed, the major part of the book is devoted to a discussion of classes of spaces which are topological generalizations of complexes in much the same way that the abstract complex of *Algebraic Topology* is an algebraic generalization of a finite simplicial complex.

There have appeared in the literature definitions of two such classes which are successful from the point of view of giving rise to interesting and well developed bodies of theorems. The first of these, due to Borsuk, is the class of absolute neighborhood retracts, and the second, due to Lefschetz, is the class of LC* spaces. Both these classes have come to be of considerable topological importance, so the development given here of their essential properties, and of their mutual relations, will be welcomed by all topologists.

There are four chapters. The first is a discussion of various topologies which can be imposed on an infinite complex. A "natural" topology is obtained by taking as a basis for open sets the stars of vertices in all subdivisions. An interesting metric can also be defined and the two topologies are equivalent when the complex is locally finite, the case most used in later applications.

Chapter II is an extension of the discussion in *Algebraic Topology* of singular and continuous cycles. A few new notions along these lines are developed for later use.

In Chapter III a number of topics are dealt with, all dealing with existence theorems for various types of mappings of one space into another. First the Alexandroff theorem on the mapping of a space into the nerve of one of its coverings is generalized by giving necessary and sufficient conditions on the covering for the existence of such a mapping. This has interesting applications to Tychonoff and normal spaces, leading among other things to a characterization of the former.

Next are the proofs of two of the fundamental theorems from di-