in Chapter III continuous mappings of polyhedra into polyhedra are studied by means of the induced homomorphisms of the homology groups.

The presentation is rigorous and straightforward, but very concise. No previous knowledge of topology as such is necessarily required. The book's one defect, acknowledged by the author in his preface, is the complete omission of illustrative examples; despite this, the reviewer warmly recommends it to a beginning research student in topology who wishes to obtain a basic source of information on homology groups in combinatorial topology. W. H. COCKCROFT

ALEKSANDROV, P. S., *Combinatorial Topology*, Vols. i and ii (Graylock Press, Rochester, N.Y., 1956, 57), 225 pp., 244 pp., $11.45.

These two volumes are a translation of Parts I, II and III of the first (1947) Russian edition of the author's *Kombinatornaya Topologiya*. A few English references and additions to the bibliography have been made by the translator. The work as a whole is intended for the student beginning topology, and is intended to give such a student a thorough grounding in the "classical" uses, in the subject, of homology (and cohomology) theory. It is written with great care; and, particularly with the beginner in mind, has a wealth of figures, illustrative examples, illuminating remarks and calculations.

Parts I and II constitute the first volume. Elementary properties of topological spaces are first well surveyed. There follows a proof of the Jordan curve theorem and of the fundamental theorem of the topology of surfaces. The volume closes with a full treatment of geometric complexes, a proof of Sperner's lemma with its corollaries, and an introduction to dimension theory.

The second volume contains Part III of the book. Here for the first time the homology and cohomology groups are introduced. They are defined first for locally finite abstract complexes and then for compacta. Various proofs of invariance are given. For polyhedra, for example, a direct proof (in the simplicial manner, by means of subdivisions) is given, in addition to the proof as a deduction from that for compacta. A variety of coefficient groups is employed throughout. The volume closes with a chapter on relative cycles and homology, and applications thereof to pseudomanifolds with boundary and to homology dimension theory.

As the author admits, the book does not begin to exhaust even the basic branches of modern combinatorial topology. It is nevertheless a substantial text, offering the beginner an excellent insight into the subject. W. H. COCKCROFT

GODEMENT, ROGER, *Topologie Algébrique et Théorie des Faisceaux*, Vol. i, Actualités scientifiques et industrielles 1252, Publications de l'Institut de Mathématique de l'Université de Strasbourg XIII (Hermann, Paris), 283 pp., 3600 francs.

This is the first book to appear on the general theory of sheaves and satisfies a long-felt want. The subject is developed from a general point of view, and contains no account of the applications to algebraic geometry and topology, although particular examples from these fields are used continually to illustrate the general theory. The opening chapters develop the required basis of homological algebra, semi-simplicial complexes and spectral sequences. The cohomology theory is defined by using a flabby resolution of the sheaf, a method which applies to an arbitrary topological space. The isomorphism with the Čech groups is shown when there is a paracompact family of supports. A second volume will deal with relations between sheaves and singular homology, duality in manifolds, fibre spaces, and cohomology operations. D. J. SIMMS