I think it very likely that the book will succeed as a standard work of reference in the subject for some years to come.

R. FLETCHER

GIBLIN, P. J., *Graphs, Surfaces and Homology: Introduction to Algebraic Topology* (Chapman and Hall, 1977), xv+329 pp., £4·95.

The book is an introduction to algebraic topology that concentrates on the properties and applications of simplicial homology theory. The author has neatly avoided some of the problems usually associated with such an approach and which stem from the relationship between the combinatorial structure of the simplicial complex and the topological structure of its underlying space. By taking the notion of a simplicial complex as fundamental and keeping the idea of continuity in the background as a motivation he can discuss the topological invariance of simplicial homology without ever having to prove it; instead he proves the simpler result that the homology groups are invariant under stellar subdivision which is quite sufficient for his purpose. When it comes to making computations of homology groups traditional exact sequence methods are used together with the invariance of the homology groups of a simplicial complex that is collapsed onto a subcomplex and the consequent introduction of the technique of collapsing at this elementary level is a most welcome feature of the book.

The book begins with chapters on graphs and surfaces and these both help to motivate the later definitions of simplicial complex and homology group and allow some account to be given of recent results in this area such as the Ringel-Youngs theorem on embedding graphs in surfaces. These topics reappear in the final chapter where a version of Lefschetz duality is employed in order to determine the number of regions into which a surface is divided by a subcomplex, the number depending on the rank of the second relative homology group. In its emphasis on graphs and surfaces the book is complemented by the similarly titled book of A. T. White: Graphs, Groups and Surfaces (North Holland, 1973) which would be a suitable sequel for a reader interested in this area.

A second comparison can be made with White's book in terms of the actual appearance of the printed page. Both books seem to have been reproduced from a typescript by using photolithography or some similar technique and so are dependent on a typewriter keyboard for their type face. This limitation is liable to produce a monotonous appearance if it is not mitigated by judicious use of indentation and display. White's book is a good example of what can be achieved in this area and it is regrettable that the book under review could not have received a similar treatment. Unfortunately the numerous digressions and examples with their asterisks and X's are embedded in the mainstream of the text in a way that often makes it difficult for the reader to grasp the exact status of what he is studying at any particular instance. The moral seems to be that if typesetting costs are to be saved then a larger area of paper will be required and a significant amount of it must be left blank, which presumably means a larger page size than that which is customary in the series of which this book is a member. This involves difficult and complex decisions being reached by publisher, printer and author, but consideration must be given to the matter of appearance if books such as this are not to have their considerable intrinsic merit obscured by the cramped appearance of their printed pages.

Despite these objections to the appearance of the book, I believe there is much in it that will repay careful study. The digressions and examples are often of great interest, there is an ample supply of admirably executed diagrams and wherever possible the author emphasises the underlying geometry.

R. M. F. MOSS