continuity; following that compactness and product spaces are discussed. There is then a chapter on Metric Spaces, which were first introduced earlier in the book. Function spaces, nets and convergence and continuous curves are also treated; the last sections lead up to a proof of the Hahn-Mazurkiewicz Theorem. Thus the book covers some worth-while topics, without doing too much. I would recommend it enthusiastically to any beginner. E. M. PATTERSON

MILNOR, J., *Lectures on the h-Cobordism Theorem*, Notes by L. Siebenmann and J. Sondow (Princeton Mathematical Notes, Oxford University Press), 18s.

In 1962 Stephen Smale (On the structure of manifolds, *Amer. J. Math.* **84**, 387-389) proved that if W is a compact smooth manifold with two simply connected boundary components V and V' of dimensions greater than 4, both of which are deformation retracts of W, then W is diffeomorphic to $V \times [0, 1]$ and V is diffeomorphic to V'. In these preliminary informal notes of a Princeton seminar on differential topology, a proof of this theorem is presented. The original methods of Smale are circumvented and an argument is given which is inspired by recent ideas of Marston Morse. Thus the use of handlebodies in the manner of Smale is avoided completely and the proof proceeds by constructing a Morse function for W which is successively simplified by alteration and elimination of its critical points until no such points are left, and W is in consequence seen to be a product cobordism between V and V', as required.

W. H. COCKCROFT

MUMFORD, D., *Geometric Invariant Theory* (Ergebnisse der Mathematik und ihrer Grenzgebiete. Band 34. Springer-Verlag, Berlin).

The main purpose of this book is to investigate two invariant-theoretic problems in algebraic geometry. In classical terminology (which the author nowhere uses) the first is: if an algebraic variety V is acted on by an algebraic group G, when does a decomposition variety V/G exist? The second investigates what the author calls moduli; classically, the Riemann surfaces with a given genus are specified, conformally, by a number of parameters (moduli) and the ultimate generalisation (suitably interpreted!) appears as: when can a set of algebraic varieties be turned " naturally " into an algebraic variety? This is soon restricted to specific cases and related to the first problem, i.e. the desired variety becomes a decomposition space.

The book is written throughout in the language of schemes and, owing to the generality and relative inaccessibility of the background material, the book is made to serve as " an exposition of a whole topic ". A number of years has now passed since Grothendieck first began to develop his theory of pre-schemes. The full—and only—version of this work has never been completed, although several volumes have appeared and the author here succeeds in giving a readable and condensed account of much of Grothendieck's work. Nevertheless, the readership of the book will necessarily be small owing to the peculiarities of the expository section itself (that this is probably intentional appears from the specialised bibliography): from the onset the reader is assumed to be familiar with pre-schemes (surely, a small additional chapter could have dealt with this) and there is much reference to unpublished material.

However, the book is well written, and the fast flow of concepts should convince any die-hard geometer of the value of schemes.

P. H. H. FANTHAM

MATES, B., *Elementary Logic* (Oxford University Press), 42s.

This book sets out to cover the basic notions of logic in a way which is both rigorous and comprehensible to the beginner. After a couple of introductory chapters dealing with the fundamental ideas the author sets up a formalised predicate calculus