Each chapter ends with exercises which test the understanding of the text and indicate extensions of the theory. A very substantial number of topics are dealt with, and the treatment of some is, perhaps necessarily, somewhat sketchy. Some readers would no doubt prefer a more intrinsic treatment of parts of the book, especially Chapter IV; moreover, the book contains a number of inaccuracies. However, the author has succeeded in giving the reader a good commentary on the subject as a whole, and a useful list of references to original sources.

T. J. WILLMORE

LANG, S., *Introduction to Differentiable Manifolds* (John Wiley & Sons, 1962), vii+126 pp., 53s.

The purpose of this book is to fill the gap which exists in the literature dealing with that branch of mathematics which borders on differential topology, differential geometry and differential equations. The essential contribution of this book is to show that nothing is lost in clarity of exposition if a manifold is defined by means of charts of Banach or Hilbert Spaces rather than finite dimensional spaces. In fact, the claim is that there is a positive gain from the indiscriminate use of local coordinates $x_1, \ldots, x_n$ and their differentials $dx_1, \ldots, dx_n$. Moreover such a treatment is necessary when dealing with infinite-dimensional spaces, and there is every indication that the systematic introduction of infinite-dimensional topological spaces will have successful results in the theory of differentiable manifolds.

Chapter I gives a brief resumé of differential calculus, following the viewpoint of Dieudonné's *Foundations of Modern Analysis*, Chapter VIII. Chapter II describes manifolds by means of charts of Banach spaces. Chapter III describes vector-bundles, and exact sequences of bundles. Chapter IV, on " Vector fields and differential equations ", collects a number of results which make use of the notion of differential equations and solutions of differential equations. In particular, there is an interesting account of " sprays ". Chapter V is about differential forms, exterior differentiations and the Poincaré Lemma. Chapter VI gives a proof of a generalisation of the Frobenius Existence Theorem. Chapter VII, about riemannian metrics, shows how a riemannian metric determines a spray and hence geodesics. In this chapter use is made of the standard spectral theorem for (bounded) symmetric operators, and a proof of this theorem is given in Appendix I. Although his treatment avoids the use of local coordinates, the author recognises that in the finite-dimensional case, they constitute an effective computational tool. In Appendix II he interprets differential forms, sprays and the riemannian spray in terms of these local coordinates.

I think that few readers will find the book easy reading, even though it is largely self-contained. There is little doubt, however, that this is an important contribution to the literature, and that it will have an important influence on workers in the fields of differential topology, differential geometry and differential equations.

T. J. WILLMORE

WILLIAMSON, J. H., *Lebesgue Integration* (Holt, Rinehart and Winston, London, 1962), viii+117 pp., 26s.

Although this book was conceived by its author as an introduction to more advanced texts on measure and integration, it is not aimed, as for example is J. C. Burkill's Cambridge tract on the subject, towards readers who may have no wish to plumb the depths of the theory of real functions; it is a book on Lebesgue integration for those who have an interest in functional analysis, and in this field it is undoubtedly a good book. The treatment is in the general setting of n-dimensional Euclidean space.