countable type" is used in place of the more usual "countably decomposable" or "σ-finite". Notwithstanding these reservations, I consider this book valuable both as a reference source and, in conjunction with examples of the sort given by Dixmier and Sakai, as a clear and readable introduction to von Neumann algebras and Tomita-Takesaki theory.

A. S. WASSERMANN

KOSTRIKIN, A. I., *Introduction to algebra,* translated by N. Koblitz (Universitext, Springer-Verlag, Berlin-Heidelberg-New York, 1982), 575 pp., £16·50.

This book is far too expensive to be realistically recommended for purchase to today's overdrawn undergraduates, but should certainly be acquired by university libraries. Like many books for undergraduates it has grown out of a course of lectures, or rather in this case, out of two courses of lectures, for the book is formally divided into two roughly equal parts corresponding respectively to a first and a third semester course at Moscow University. This is a source of strength, in that the material is thoroughly class tested and the associated exercises are interesting, varied and apposite; but it gives rise to a weakness in that the elementary real vector space theory of Part 1 is an inadequate preparation for the material on group representations and modules in Part 2. The Moscow students are well catered for, since they receive a second semester course on linear algebra and geometry, but the reader of this book enjoys no such advantage and the attempts that are made to plug the gap are not entirely successful.

It is certainly interesting to see what is taught in an important (and presumably not too unrepresentative) Soviet institution and to realise that their traditions in algebra teaching are not very different from our own. Part 1 begins with "concrete" linear algebra (with vectors as n-tuples of real numbers) and includes an unusually thorough chapter on determinants. From there it proceeds to a fairly typical first course on groups, polynomials, rings and fields, with perhaps a greater emphasis than usual on polynomials as such. Part 2 begins with a long chapter (64 pages) of graphs followed by an even longer chapter (86 pages) on representations going as far as character theory and tensor products. This leaves relatively little space for further developments in rings and fields, and so although many interesting aspects (such as finite fields and ruler and compass construction) are discussed in the final chapter there is no systematic exposition of the Galois group, and the insolubility by radicals of the quintic, heralded in the introduction as one of the motivating problems of abstract algebra, is not in fact discussed in detail.

The exposition is precise, careful and thorough and the translation reads so smoothly that it is hardly ever noticeable that English was not the original language. The photographically reduced typescript has been produced very skilfully and deserves to be supplemented by less amateurish diagrams.

In summary, this book will be a useful source for both teacher and student and should be valued by both, not least for its wide-ranging and striking examples of the application of algebraic ideas.

J. M. HOWIE

ROBINSON, D. J. S., *A course in the theory of groups* (Graduate Texts in Mathematics Vol. 80, Springer-Verlag, Berlin-Heidelberg-New York, 1982) xvii+481 pp., DM 98.

This is a lovely book, whose stated aim and intention (successfully accomplished) is to give an introduction to the general theory of groups. The reader is expected to have the maturity of a year's graduate study in a British or American university, with a good basic knowledge of rings, fields, modules and the like. The writing is meticuously clear and concise. While not leisurely, it is not terse and indeed it is done with such enthusiasm and erudition as to carry the reader happily along. Many examples of groups are given, the life-blood of the subject, of course; in addition there is a truly vast set of exercises (some 650 in all!), varying from the elementary to the really quite challenging. Some of them are required for the subsequent development, and are noted as