some new examples, and a chapter on the application to primitive divisors of Lucas and Lehmer numbers.

Other topics of transcendence have not found such application outside the theory. There are several chapters on transcendence theory of elliptic and abelian functions, which can now prove, for example, that $\Gamma(\frac{1}{4})$ is a transcendental number. Then follows a section on independence results concerning meromorphic functions and polynomials in several variables. This includes an exposition of Čudnovskiĭ's new concept of the semi-resultant of two polynomials—an idea that could have wider application. Finally there are some new applications of a method due to Mahler for proving the transcendence, at algebraic points, of a function satisfying certain functional equations.

Often it is unclear why conferences should produce proceedings volumes; for their contents would be as appropriately published, and more widely circulated, if it appeared in research journals. In this instance the editors intended to mould the contributions into an advanced graduate text that would bring the reader to the frontiers of research in transcendence theory. They have achieved a praiseworthy degree of success.

D. A. BURGESS

HALMOS, P. R. and SUNDER, V. S., *Bounded Integral Operators on $L^2$ Spaces* (Ergebnisse der Mathematik und ihrer Grenzgebiete, Springer-Verlag, 1978), 132 pp., Cloth DM 33, U.S.$18.20.

This book is concerned with the common area of the classical theory of integral equations and the modern algebraic approach to bounded linear operators on Hilbert space. The three principal questions dealt with are: (a) which operators on $L^2$ of a prescribed measure space are integral operators; (b) which operators are unitarily equivalent to integral operators; (c) which operators are such that their unitary equivalence class consists only of integral operators. Many classical examples, associated with such names as Abel, Volterra, Hilbert, and several important classes of integral kernels (in particular Carleman kernels and "order-bounded" kernels) are discussed. The book gives a systematic presentation of current knowledge and the unsolved problems and suggests lines of further research. It is clearly and concisely written and should prove invaluable both to specialist and non-specialist alike.

H. R. DOWSON

SKORNJAKOV, L. A., *Elements of Lattice Theory* [Translated from original Russian edition (*Elementi Teorii Struktur*) by V. Kumar.] (Adam Hilger Ltd., Bristol 1978), vii + 148 pp., cloth, £15·00.

This compact introduction to Lattice Theory deals with the following topics (each is a chapter heading): partially ordered sets; ordinal numbers; complete lattices; lattices; free lattices; modular lattices; distributive lattices; boolean algebras. The author assumes only that his reader has a grasp of the fundamentals of elementary set theory. On the whole, this slim text is well-written, though there are places where the reader has to do some work to solidify the arguments, especially where translational difficulties arise. For example, the enunciation of Theorem 4 (p. 120) is quite wrong (and obviously so in view of the preceding result); and in Theorem 17 (p. 109) we have an expression $a = b_1 \dotplus p_1 \dotplus \dots \dotplus p_m$ followed by the statement that "$m = 0$ is possible". These minor difficulties apart, this is an interesting text and covers a lot of basic material. The section on ordinal numbers covers the equivalence of the axiom of choice and those of Zorn, Zermelo, Hausdorff; and also the Cantor-Bernstein theorem. Complete lattices and closure mappings are dealt with (unusually) before lattices. In the section on lattices the author considers congruences and proves Dilworth's theorem (that any two congruences on a relatively complemented lattice commute) and relates congruence kernels to the standard ideals of Grätzer and Schmidt. There then follows a rather difficult chapter on free lattices. The rest of the text is less of an ordeal and deals, in a nicely compact way, with standard results in modular, distributive and boolean lattices. In particular, these include the Kurosh-Ore theorem (on irredundant $\wedge$-representations in modular lattices), Hashimoto's theorem (that a lattice is distributive if and only if every ideal is a congruence kernel) and the Glivenko-Stone theorem (that the MacNeille completion of a boolean algebra is a complete boolean algebra). All in all, then, an interesting text with an interesting repertoire. But, the price: £15 for less than 150 pages is, in anyone's reckoning, awful.

T. S. BLYTH

DORLING A. R. (editor), *Use of Mathematical Literature* (Butterworths, 1977), xii + 260 pp., £12·00.

One of the more frustrating aspects of my early days as a research student was the difficulties encountered in any search for relevant literature. Even experienced research mathematicians can experience frustrations in this area. So a book such as this one is most welcome, and it will no doubt prove to be useful for many. Its contents divide into two parts. The first three chapters, written by professional librarians concern general aspects of mathematical literature and the use thereof. The rest of the book consists of eleven chapters on various fields of mathematics written by experts in the appropriate subject.

The first three chapters are well worth reading by any research student at a very early stage. They will give him a very good idea of how to use mathematical literature. The two authors of these chapters seem to have covered the ground well, and have mentioned most possibilities. However there are now a few bibliographies and/or newsletters being produced which cover a narrow but well-defined area. In general they are duplicated and circulated on request. It is not surprising that they were missed by these two authors.

The remaining eleven chapters, as well as areas of research mainly in pure mathematics, also cover Mathematical Education and History of Mathematics. Each chapter reflects the interests of the author and the approach to the task is not uniform. For anyone working in an area covered by one of these surveys, they will form a very useful introduction. But not every subject is covered, and the rate of advance in most subjects means that any such survey is soon out of date.

This book is a useful introduction to the mysteries of mathematical literature. Any mathematician who wishes to start searching the literature would find it helpful to consult it, and most libraries should buy a copy for reference.

J. D. P. MELDRUM

HANDSCOMB, D. (editor), *Multivariate Approximation* (Academic Press, 1978), xiii + 353 pp., £12·50 or $25.75.

Approximation in several variables is a much more difficult subject than that in one variable, if only because of lack of unisolvency and the possibility of complicated domains. This book contains a collection of papers based on talks given at a Symposium in Durham in 1977, supported by the London Mathematical Society and the United States Army European Research Office. Although the editor warns that the reader should not expect an "all-inclusive coverage", the 25 papers do range over a significant part of the field. There are some specialised, some general, and some involving applications. Regarding the latter, the finite element method is never far from the scene, since it is one of the more important users of such approximation theory. There are several papers devoted to generalising one-variable theory. The only significant omission appears to be the lack of contribution from the Soviet Union—the editor admits that the organisers were unable to raise such a speaker. There is a collection of research problems at the end of the book. On the whole the papers seem interesting, and I think it a worthwhile venture to publish this collection, especially since there is no similar publication available.

D. W. ARTHUR