BOOK REVIEWS

STRĂTILĂ, S. *Modular theory in operator algebras* (Editura Academiei, Bucharest, and Abacus Press, Tunbridge Wells, 1981), 492 pp. £33.

Takesaki's monograph *Tomita's theory of modular Hilbert algebras and its applications* (Lecture Notes in Mathematics 128) appeared in 1970, and opened a new chapter in the study of von Neumann algebras; by the mid 1970s a vast new body of results had appeared. Their principal author was Alain Connes, but important contributions were made also by Arveson, Haagerup, Takesaki, and others.

Before the advent of the Tomita–Takesaki modular theory, von Neumann algebras, and in particular factors, of type III were rather poorly understood. In his thesis Connes defined several invariants for type III factors and, using ideas of Arveson, developed various powerful tools for analysing their structure. One of the most striking results of the theory is that a type III von Neumann algebra can be expressed as a crossed product of a type II algebra by an action of $\mathbb{R}$ or $\mathbb{Z}$. The effect of this is to reduce the study of type III von Neumann algebras to that of type II algebras and their automorphisms.

The book under review, in some ways a sequel to Strătilă and Zsidó's *Lectures on von Neumann algebras* (Abacus Press, 1979), presents a unified account of this theory together with much useful background material. It is by far the most comprehensive exposition of these topics to have appeared so far as a book. As such it will prove extremely valuable both to specialists and those attempting to learn the subject.

There are six substantial chapters, devoted successively to normal weights, conditional expectations and operator-valued weights, automorphism groups, crossed products, continuous decompositions, and discrete decompositions; there is also a short appendix on unbounded operators. The presentation is clear and to the point, except perhaps in the chapter on crossed products, where the approach, using Kac algebras, is rather more general than the context requires. A more straightforward approach (cf. A. van Daele, *Continuous crossed products and type III von Neumann algebras*, LMS Lecture Notes 31) would be less daunting for the novice. I find also that the layout is in many places unduly cramped, and this makes some of the more intricate proofs rather tiresome to read through.

These minor reservations notwithstanding, this volume is a valuable addition to the literature on operator algebras. Presenting as it does some of the most acclaimed work in functional analysis of the past fifteen years, it is an essential acquisition for any university library, and I am sure that nobody working in operator algebras would wish to be without it.

<div align="right">SIMON WASSERMANN</div>

ItÔ, K. *Introduction to probability theory* (Cambridge University Press, 1984), 211 pp. £18.50 cloth, £6.95 paper.

This book is a translation by the author of the first four chapters of a more extended Japanese volume entitled "Probability Theory". The book is intended to "explain basic probabilistic concepts rigorously as well as intuitively" and I presume it is intended for students attending their first serious course on analytic probability theory. The only essential prerequisite for the material is a basic knowledge of point set topology.

The distinctive features of this text include (i) a determined effort to develop the formal machinery in a way that corresponds to our intuitive thinking; (ii) the early introduction of the topological aspects of measure theory; and (iii) some traditionally difficult and frequently omitted theorems presented in a clean accessible manner. In this latter aspect the work is excellent. One

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