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BULLETIN (New Series) OF THE
AMERICAN MATHEMATICAL SOCIETY
Volume 20, Number 2, April 1989
©1989 American Mathematical Society
0273-0979/89 \$1.00 + \$.25 per page

Ring theory (2 volumes), by Louis H. Rowen. Pure and Applied Mathematics, volumes 127 and 128, Academic Press, San Diego, 1988, XXIV + 538 pp., \$89.50 ISBN 0-12-599841-4 (volume I), xiv + 462 pp., \$84.00 ISBN 0-12-599842-2 (volume II).

As in many areas of mathematics, most of the research in noncommutative ring theory—including some basic results—is less than thirty years old. As recently as 1956, Jacobson was able to include most of the subject in his classic *Structure of rings* [J], a book of moderate size. But by the time he revised *Structure of rings* in 1964, Goldie's Theorem and other new developments had appeared, and he merely sketched them in appendices.

It is not surprising that after *Structure of rings* no one has tried to write a book covering all of ring theory. Rowen has not gone quite so far in the two volumes under review, but his *Ring theory* is the most ambitious and encyclopedic book yet written in the area. It is both a textbook and an up-to-date encyclopedia of research. Roughly speaking, the greater part of volume I covers basic structure theory, and is meant to be the basis of a graduate level ring theory course; volume II and parts of volume I treat specialized areas of ring theory in which research is active today. These include noncommutative Noetherian rings, homological algebra, polynomial identities, central simple algebras, and enveloping algebras. The one major topic omitted is the representation theory of Artin algebras.

It is useful to consider separately three potential audiences for *Ring theory*, all beyond the undergraduate level: Graduate students, for whom it will be a textbook; experts (= ring theorists), for whom it will be a compendium of recent research; and nonexperts (= established mathematicians who are not ring theorists), for whom it will be a guide to the subject. For all of them, it also serves as a reference.

As a textbook for graduate students, *Ring theory* joins the best. The only other books which I think make excellent textbooks are *Noncommutative*