because of D. S. Passman's excellent exposition elsewhere, but I still think that Roseblade should have been mentioned.) In the discussion on enveloping algebras, only the solvable case is discused (as the authors admit because of lack of space), but it would have been useful to have at least some outline of the rapid developments in the semisimple case. In the chapter on K-theory, mention could have been made of D. R. Farkas and R. L. Snider's work on the Zero Divisor Question and its extension by J. A. Moody and others. My point is this: given that Ring Theory, both in its theorems and techniques, has proved so important in applications, the more applications that could have been included the better. To be fair, a number of applications are given and others are mentioned, for example Bernstein's Theorem on analytic continuation and Amitsur's non-crossed product division algebras.

The contents are as follows. 0. Preliminaries. 1. Some Noetherian rings. 2. Quotient rings and Goldie's theorem. 3. Structure of semiprime Goldie rings. 4. Semiprime ideals in Noetherian rings. 5. Some Dedekind-like rings. 6. Krull dimension. 7. Global dimension. 8. Gelfand–Kirillov dimension. 9. The Nullstellensatz. 10. Prime ideals in extension rings. 11. Stability. 12. K_0 and extension rings. 13. Polynomial identity rings. 14. Enveloping algebras of Lie algebras. 15. Rings of differential operators on algebraic varieties.

To conclude, this is an excellent account of the theory of noncommutative Noetherian rings which I recommend without qualification. Both authors were students of A. W. Goldie, as was the reviewer. Long live Alfred Goldie!

PATRICK SMITH

FREESE, R. and MCKENZIE, R., *Commutator theory for congruence modular varieties* (London Mathematical Society Lecture Note Series 125, Cambridge University Press 1987) 227 pp. 0 521 34832 3, £15.

In group theory a number of important concepts, such as Abelian, soluble and nilpotent groups, centre, centralizers, etc. are defined in terms of the commutator: $[x, y]=x^{-1}y^{-1}xy$. The commutator of normal subgroups can be defined as a normal subgroup and used for almost all these concepts. The idea of a commutator has been extended to ideals of a ring. Recently it has been extended much further.

One of the more interesting recent developments in general algebra theory has been the development of this general commutator theory. A variety V of algebras is called a congruence modular variety if the lattice of congruences of any algebra in the variety is modular. A commutator is then defined as a binary operation on the lattice of congruences of an algebra. It reduces to the classical commutator in the case of groups. The theory of these commutators is presented here.

There are fourteen chapters which provide the basic theory linking together several definitions of the commutator and presenting many very powerful and interesting applications. We now mention some of them. A centre is defined for arbitrary algebras and a theory of nilpotent algebras is developed. Certain rings are associated with Abelian varieties and their structure is determined. Strictly simple algebras are studied. A variety of Mal'tsev conditions are considered. These are equations, holding between terms in the algebra, which characterize properties of the congruence lattice. The last chapter presents a very powerful finite basis result concerning modular varieties of finite type.

Commutator theory is an interesting new development in general algebra and this book provides a good introduction to the subject. There are a number of exercises which contain some further results and some examples. Solutions to the exercises are given. There are also some interesting historical comments at several points. This is a worthy addition to the London Mathematical Society Lecture Note Series.

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