The Burnside problem for matrix groups was solved by Schur (1911) who proved that a finitely generated periodic matrix group over C is finite. This was generalized to arbitrary fields by Kaplansky (1965) and to semigroups by McNaughton and Zalcstein (1975). The author presents the latter result using methods of G. Jacob, and in the opposite direction gives examples of infinite sequences without repeats (Morse-Hedlund sequence, though his actual examples follow J. Leech and F. Dejean).

The final chapter is devoted to Foata's theory of "rearrangement monoids", which leads to a quick and transparent proof of MacMahon's Master Theorem, and there are some illustrations from matching problems. The topic is closely related to factorizations in free monoids and bases in free Lie algebras, and these connexions are briefly sketched.

The writing is terse but clear; the many worked illustrations and exercises are particularly useful. While the first four chapters form an excellent introduction to semigroup theory, the account of language theory that follows it is inevitably somewhat biased, being seen from the viewpoint of semigroups. This would make it rather hard as a first introduction, but for anyone with even a nodding acquaintance of language theory it provides an interesting attempt to present an integrated account of these topics. It is only partly successful because the author has perhaps spent a disproportionate amount of space on rather recondite properties of languages because they happen to involve semigroups. However, this is more than made good by the many simplifications, and new applications of semigroup theory. There are one or two slips, of logic (isomorphism of composition series is so defined as to be nonreflexive), spelling (p. 91 preversed, p. 333 envelopping), a curious confusion of left and right on p. 4 and a definition of generating set which quite outdoes Bourbaki (see also the rather bizarre definition of mathematical problem, p. 127). But these are trifles which do not in any way detract from a highly readable book, which will surely help to kill the myth that there are no exciting results in semigroup theory.

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The representation theory of the symmetric groups, by G. D. James, Lecture Notes in Mathematics, Volume 682, Springer-Verlag, Berlin and New York, 1978, vi + 156 pp.

Since every finite group G is a subgroup of some symmetric group $\mathfrak{S}_n$, consisting of all the $n!$ permutations on n objects, the representations of $\mathfrak{S}_n$