interest. Some readers however, may find the abstract presentation not so satisfying perhaps as the lemmas dispensed with. There is a feeling as if a well known piece of prose were translated into some foreign language. One would have thought that there was not much opportunity for new results on cubic units. It comes as a surprise when he shows that if ϵ is the fundamental unit of a cubic field with negative discriminant, D, then $4\epsilon^3+24>|D|$, a result of some use in calculating a fundamental unit.

There is no need to recommend the purchase of this excellent book to those familiar with Artin's name as they will buy it as a matter of course. It can be recommended very strongly to those who are not familiar with his work, but have the preliminary requisite knowledge, and are interested in the various aspects and facets of number theory. They will find the book an intellectual treat of the first order.

Professor Artin would confer a boon on those interested in number theory if this book was followed by another volume dealing in his own inimitable way with other aspects of algebraic number theory not dealt with in his Princeton and New York lectures on algebraic numbers and algebraic functions.

L. J. MORDELL

Representation theory of the symmetric group. By G. de B. Robinson. University of Toronto Press, Toronto, 1961. 8+204 pp. $6.00.

This monograph deals with a specialized and highly technical part of group theory, namely the calculation of the modular irreducible representations of the symmetric group. The most important part of the book (Chapters 7 and 8) contains many results, so far unpublished, due to the author and his collaborators. The earlier part of the book consists of preparatory material, classical results on group theory and representation theory in general and on the representations of the symmetric group in particular.

The pace here is fairly rapid, many details of proofs being omitted, but full references being given to original sources or more detailed discussions. Although one cannot, of course, object to sketchy treatment of classical material in a specialized monograph, there are nevertheless one or two points which seem to have been left rather obscure. For example the definition of an induced representation is rather difficult to follow. Also there appears to be some confusion in §12.1; namely the field of characteristic p which is used does not seem to be Σ itself, but rather the residue class field modulo a certain prime.

The most attractive feature of the book is the wealth of examples with which the author illustrates each stage of his argument. Indeed this is perhaps an indispensible feature of a work which is intended to lead the reader into consideration of the many open problems remaining in this field.

A summary of the contents is as follows: I. A survey of classical representation theory, ordinary and modular; II. Young tableaux and the representations of the symmetric group; III. The connection between the representations of the symmetric group and those of the full linear group; IV. The calculation of characters corresponding to a given Young tableau; V. Blocks of representations; condition for two representations to belong to the same block; VI. Analysis of the set of representations in a block and computation of the number of modularly irreducible representations in a block; VII and VIII. Computation of the decomposition of an ordinary representation into modularly irreducible components; new results due to J. H. Chung, O. E. Taulbee, Diane Johnson and the author.

Note. The author has pointed out to me that in paragraph 8.2 ff. repetitions of an admitted permutation may belong to different components when $p=2$. Consequently corrections are necessary to the tables 2.7–2.10 and Theorem 8.41.

ANDREW H. WALLACE

Relativity: The general theory. By J. L. Synge. North-Holland Publishing Company, Amsterdam, 1960. 505+15 pp. $16.50.

The latest of Synge's books shares the virtues of his earlier ones: it is well written, it is interesting, it is different from other books on relativity.

Mathematicians and theoretical scientists can be roughly divided into geometers and algorists, Riemann being a good example of a geometer, even when he works in analysis, and Descartes an example of an algorist, even when he works in geometry. Synge is a geometer, and his two books on relativity give special pleasure to those who, like the reviewer, think best when they can see pictures in their mind. One can go further and say that only geometers can fully understand Einstein's theory of relativity. Students of relativity who wish to become geometers should read Weyl's *Space-Time-Matter* or Synge's *Relativity*, and preferably both.

Relativity: The general theory is the continuation of *Relativity: The special theory* (North-Holland, 1956). The first three chapters cover mathematics and the kinematics of general relativity. Chapter IV reviews continuum mechanics and introduces the differential equations of the gravitational field. Chapter V discusses some solutions and the Cauchy initial value problem for the gravitational field equa-