The reviewer is pleased to announce that the belated appearance of this review is solely due to the belated appearance of a review copy in the editorial office of this journal.

D. S.

1. C. L. Baker & F. J. Gruenberger, *The First Six Million Prime Numbers*, The Rand Corporation, Santa Monica, published by The Microcard Foundation, Madison, Wisconsin, 1959. Reviewed in *Math. Comp.*, v. 15, 1961, p. 82, RMT **4**.

2. D. H. Lehmer, "Tables concerning the distribution of primes up to 37 millions," 1957, ms. deposited in the UMT file and reviewed in *MTAC*, v. 13, 1959, p. 56–57, RMT **3**.

74[G].—Ludwig Baumgartner, *Gruppentheorie*, Walter de Gruyter & Co., Berlin, 1964, 190 pp., 16 cm. Price DM 5.80 (paperback).

This is the fourth edition of a compact textbook on group theory, which first appeared in the year 1921. Though there is probably not a single sentence in common to the two editions, the book has retained the pedagogical skill of the exposition and of the many exercises (now 151) illustrating the concepts developed in the text in unbroken sequence.

The content of the present edition may be characterized as a substantial portion of the union of the textbooks on group theory by A. Kurosch and by the reviewer (first edition) emphasizing basic concepts, but not considering transfer theory, lattice theory, extension theory, theorems on not finitely generated abelian groups, etc. The attractive historical references and sections on geometric groups of the first edition have given way to a treatment of group theory governed entirely by the restrained abstract viewpoint of the thirties and forties. The group tables appended to the book are very useful for teaching and self-study purposes.

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75[G].—C. A. Chunikhin, *Podgruppy Konechiykh Grupp* (*Subgroups of Finite Groups*), Nauka i Technika (Science and Technology), Minsk, 1964, 158 pp., 21 cm. Price 57 kopecks.

In honor of the ninetieth anniversary of Sylow's theorems (1872) the author devotes a four-chapter monograph to the exposition of the known theorems of finite group theory about the existence of subgroups of given order of a finite group G, starting with Sylow's theorem on the existence of p-subgroups for every p-power divisor of the order of G and the conjugacy of the Sylow p-groups under G, continuing with P. Hall's theorems on Π-subgroups of solvable groups (Π a given set of prime numbers), and concluding with a detailed exposition of the author's results contained in more than 30 research papers.

In Chapter I the known generalizations of Sylow's theorems on p-groups to the corresponding theorems on Π-groups are studied. In Chapter II the factorization of the finite groups utilizing the indices of the principal or composition series is treated. In Chapter III the construction of the subgroups of a finite group, with the help of the "indexials", is discussed. Given a principal chain $G = G_0 \geqq G_1 \geqq \cdots \geqq G_\mu = 1$ ($\mu \geqq 1$) of G and a chain of subgroups $F_i | G_i$ of $G_{i-1} | G_i$ for $i = 1, 2, \cdots, \mu$ such that any conjugate of $F_i \mid G_i$ under $G \mid G_i$ already is a conjugate under $G_{i-1} \mid G_i$, then the factorization $h = \prod_{i=1}^{\mu}(F_i\,;\,G_i)$ is called an *indexial*. Chapter IV deals with complects of non-nilpotent subgroups of G. A Π-complect is defined as a mapping σ of Π into the subgroup set of G such that the order of the image of σp is divisible by p and the images of different members of Π are non-isomorphic.

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76[G].—D. K. FADDEYEV, *Tables of the Principal Unitary Representations of Fedorov Groups*, Mathematical Tables Series, Vol. 34, Pergamon Press, Ltd., Oxford, England, distributed by The Macmillan Co., New York, 1964, xxvi + 155 pp., 21 cm. Price $10.00.

The term "Fedorov group" is used in this book to denote what is more commonly called a space group, i.e., an infinite discrete group of Euclidean motions and reflexions of 3-dimensional Euclidean space which leave no point and no line or plane invariant. Space groups are fundamental in crystallography, and there are, in all, 230 of them. The subgroup, H, of any space group, G, which consists of the Euclidean translations contained in G, is an Abelian normal subgroup of G, and the factor group G/H is one of 18 different finite groups. The integral unimodular 3-dimensional representations of these finite groups define what are commonly known as crystal classes, of which there are in all a total of 73. The elements of H define a crystal lattice, which may also be denoted by H, and the lattice reciprocal to H is denoted by H^*. The lattice H^*, combined with the factor group G/H, furnishes a space group G^*, and certain space groups G have the property that the transform of a given vector, u, from the fundamental region of G^*, by any element of G differs from u by an element of H^*. Every vector u from the fundamental region of G determines an irreducible unitary representation of G, and when G has the property mentioned, this representation is termed basic. It is these basic representations which are tabulated, for all 73 crystal classes, in the present book. A short indication of how to determine nonbasic representations from the basic representations is furnished.

The book is carefully printed and should be very useful to anyone working in the field of crystallography.

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77[G, X].—HANS SCHNEIDER, editor, *Recent Advances in Matrix Theory*, University of Wisconsin Press, Madison, Wisconsin, 1964, xi + 142 pp., 24 cm. Price $4.00.

This book, the proceedings of an advanced seminar on matrix theory held at the Mathematics Research Center, University of Wisconsin, on October 14–16, 1963, is a collection of the following six papers:

1. Alfred Brauer, "On the characteristic roots of nonnegative matrices," pp. 3–38.
2. A. S. Householder, "Localization of the characteristic roots of matrices," pp. 39–60.