supplemented by a more general text if one is available. This book is in the category of general texts and is quite readable, but the material will need careful updating by the instructor.

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32 [12, 13.05].—ALFRED M. BORK, *Fortran for Physics*, Addison-Wesley Publishing Co., Reading, Mass., 1967, viii + 85 pp. 23 cm. Price $1.95 paperbound.

This rather thin (85 pages) booklet is devoted to the physicist who has had no exposure to the mysteries of computer programming. In particular, the author addresses himself to classical mechanics. Indeed, the first three chapters are devoted to the subject of classical mechanics to the complete exclusion of Fortran. By this time the reader is left wondering whether Fortran *is* Physics. However, in Chapter 4 the reader is presented with an IBM 1620 Fortran II program which, regrettably, requires a substantial textbook on Fortran II to understand it.

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33 [13.05].—JOHANN JAKOB BURCKHARDT, *Die Bewegungsgruppen der Kristallographie*, Birkhäuser Verlag, Basel, Switzerland, 1966, 209 pp., 25 cm. Price F 37.50.

There are very few readable, carefully developed derivations of crystallographic space groups available. This book is one of them. From the few known derivations of space groups, the author selects one which he has helped to develop. This derivation relies heavily on the concept of an arithmetic crystal class (which is to be distinguished from the more common geometric crystal class, or point group), and on the Frobenius congruences. The development is such as to require a minimum of mathematical background (even the required linear algebra is developed in the text). The theoretical development is accompanied by many examples, pictures, and tables.

This second edition does not differ markedly from the first, although several sections have been rewritten.

The author defines a point lattice L to be a subset of a Euclidean space R^ν which spans R^ν, which is closed under subtraction, and which has the property that there exists a positive, real number ϵ such that $x, y \in L \Rightarrow ||x - y|| > \epsilon$. A symmetry of a point lattice $L \subset R^\nu$ is then a function $f: R^\nu \to R^\nu$ such that $f(L) \subset L$, and $f(x) = Ax + a$, where A is a real $\nu \times \nu$ orthogonal matrix, and a is a real $\nu \times 1$ column matrix. The author develops some properties of lattices, and proceeds to define and develop properties of crystal classes, geometric and arithmetic crystal classes, and space groups. A few of the results obtained can be summarized in the following table.

dimension	*number of geometric crystal classes*	*number of arithmetic crystal classes*	*number of space groups*	*number of symmorphic space groups*
2	10	13	17	13
3	32	73	230	73

There are also brief discussions of space groups in higher dimensions, and of color groups.

It seems to this reviewer that a careful discussion of Bravais classes of lattices would have been desirable. Also, some discussion of isomorphism of crystallographic groups might have been worthwhile (the idea does, more or less, arise on pp. 128 and 179).

Some related but omitted topics are: (1) double groups, (2) representations of crystallographic groups, (3) experimental crystallography, (4) tensors in crystals, (5) lattice dynamics, (6) wave functions in crystals.

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34 [13.15, 13.35, 13.40].—S. H. HOLLINGDALE, Editor, *Digital Simulation in Operational Research*, American Elsevier Publishing Co., New York, 1967, xv + 392 pp., 23 cm. Price $14.50.

The scope and contents of this volume are described by the editor in his foreword, from which we quote the following:

"This volume records the Proceedings of a Conference held in Unilever-Haus, Hamburg, from 6th to 10th September, 1965. It was sponsored by the N.A.T.O. Advisory Panel on Operational Research under the aegis of the Scientific Affairs Division of N.A.T.O. About 180 people, drawn from 13 countries, participated in the Conference; 41 papers (one opening address, three survey lectures and 37 short presentations) were presented in 14 sessions.

"The purpose of the conference was two-fold; to provide an opportunity for discussion and exchange of information between practitioners of the art of digital simulation, and to inform and stimulate those who have not yet made use of the technique. With computers now widely available, the possibility of using simulation methods has come within the reach of most operational research organisations.

"It is because of the dual objectives of the Conference that the papers in this volume cover so broad a spectrum—from descriptive accounts of specific applications to specialist expositions of methodological topics—and deal with so wide a range of industrial, commercial and military applications. The contributors themselves are drawn from N.A.T.O. and Governmental organisations, industry, commerce, universities and research institutes."

E. I.