(Mostly definitions). 2. Connected Graphs (Euler lines, Paths, Mazes, Hamilton lines, Knight's Tour). 3. Trees (Connector problem, Matching vertices and edges). 4. Matchings (Assignment problems, Marriage Problem, Round-Robins). 5. Directed Graphs (One-Way Traffic, Genetic Graphs). 6. Questions concerning Games and Puzzles (Puzzles, Theory of Games, Sportswriter Paradox). 7. Relations (Use of graphs to illustrate different types of relations). 8. Planar Graphs (Kuratowski Criterion, Euler's Formula, Platonic Bodies, Mosaics). 9. Map Coloring (The Five-Color Theorem).

There are many problems. Their solutions and a glossary are given in the appendix. One of the definitions in the latter has an interesting error: "*Dodecahedron.* A polyhedron of twenty faces." Is it typographical, or did he multiply when he should have added?

D. S.

27 [X].—S. Vajda, *Readings in Mathematical Programming*, second edition, John Wiley & Sons, New York, 1962, viii + 130 p., 22 cm. Price $4.25.

This book is a revised edition of *Readings in Linear Programming*, which was first published in 1958. The title of the present edition reflects the inclusion of applications dealing with discrete linear, dynamic, and quadratic programming.

Two methods are described for solving the Hitchcock transportation problem; namely, the stepping-stone method and a network flow algorithm developed by Ford and Fulkerson. The formulation and solution of several problems in terms of a transportation model are given. In addition, variants of the transportation problem are reduced to the problem of determining a maximal flow through a network, which is solved by the Ford-Fulkerson maximal flow algorithm. The simplex method and the dual simplex method are introduced for solving the general linear programming problem. The simplex calculations are described in terms of a tableau. Many examples are provided to elucidate the details of the computational procedures involved. The concept of dynamic programming is exemplified by two simple problems involving multi-stage planning. Only linear objective functions are considered. The discussion of the application of linear programming to game theory is addressed to those who are familiar with the concept of a zero-sum two-person game.

Two types of discrete linear programming examples are presented: (1) the condition of integrality is imposed on all variables; and (2) the condition of integrality is imposed only on some specified variables. The treatment is based on the methods of R. E. Gomory.

The subject of quadratic programming is restricted to an exposition of two methods, one due to P. Wolfe, the other to E. M. Beale. These methods are applicable to the case in which the constraints are linear, but the objective function is convex quadratic.

Except for the chapter on game theory, elementary algebra is the only prerequisite for an understanding of the material presented in this book. Emphasis throughout the book has been placed on the details of specific algorithms rather than on the fundamental concepts underlying the various methods. Although the author has presented excellent representative examples of the manifold applications of mathematical programming, this book would have been more meaningful and interesting to the reader if some of the basic theorems had been included.

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28 [X].—R. L. ACKOFF & P. RIVETT, *A Manager's Guide to Operations Research*, John Wiley & Sons, Inc., New York, 1963, x + 107 p., 22 cm. Price $4.25.

This is a remarkable little book, which this reviewer and many practitioners of the art will heartily recommend to management personnel who ask, "What is operations research? Where can I find out about it in a form I can underatand?" The practical experience of the authors in dealing with management and their knowledge of the field are readily apparent throughout the pages of the book.

The two major chapters expand on the nature of operations research and describe the form and content of typical problems that lend themselves to such an approach. The shorter chapters are concerned with the relationship with other management services and the organization and administration of operations research. Differences in practice between the United Kingdom and the United States are identified, but one is more struck by the essential similarity. In addition to the major textual content there is included a list of consultants, schools and universities offering courses in operations research, a list of firms, arranged by industry, that use operations research, and an annotated bibliography. Ackoff's and Rivett's contribution should receive an enthusiastic response; the enthusiasm is merited.

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29 [X].—ALAN S. MANNE & H. M. MARKOWITZ (editors), *Studies in Process Analysis*, John Wiley & Sons, Inc., New York, 1963, viii + 427 p., 26 cm. Price $14.00.

As used by the editors, "process analysis" identifies studies "which approach the analysis of industrial capability through models reflecting the structure of productive processes." Process analysis should be differentiated in this sense from a capability analysis based on gross national product or the input-output studies which are founded on inter-industry product flows. In an introductory chapter, the editors state that "input-output analysis fail to account for alternate methods of production," seeing this as a major drawback to this type of approach. This may be true in a narrow sense, but comprehensive linear programming models based on input-output analysis have been formulated and used in which resource substitutability has been incorporated. This point is discussed by Dorfman, Samuelson, and Solow in *Linear Programming and Economic Analysis* (New York, McGraw-Hill, 1958).

Process analysis involves a model-building activity, the development of appropriate computational algorithms, and the application of model and algorithm to