Justin Aurian, Gheorghe Boldur, Simion Lazăr:

CERCETAREA OPERAŢIONALĂ ÎN CONSTRUCŢII

(Operational Research in Construction)

A series of scientific and technical books published in Romania in the last few years show the trend of modern mathematical methods to pervade into the organization of production and the management of economic activity. Among them the work **"Cercetarea operaţională în construcţii"** by Justin Aurian, Gheorghe Boldur and Simion Lazăr, recently published by the "Editura Ştiinţifică" is the first study which presents, gathered together in a whole, the main methods of operational research and their application to construction.

The material of this book is grouped in several chapters as shown hereafter.

Chapter I, headed "Operational Research — General Notions" is an excellent introductory chapter where operational research is explained with its importance and its specific methods for the organization of production, the manner in which operational research is organized, as well as the conditions required for its succesful application in construction work. Simple and instructive examples by which the operation of mathematical modelling of economic and decision processes are presented stand out in this chapter.

Chapter II presents the methods of linear programming and numerous applications in construction. Although several Romanian works deal with linear programming, the authors have considered it necessary to also present, having in view the scope of the book, besides the practical aspects of the problem, the essential features concerning the computation methods used (transport algorithm and simplex algorithm). They have succeeded, in a relatively limited space, to present with clarity the notions of linear programming required to enable a reader who tackles this problem for the first time, to *model* mathematically and to effectively solve a practical problem of the transport or of the simplex type. Obviously, a study of foreign or Romanian books dealing with linear programming is necessary in view of gaining deeper knowledge in this domain. The practical applications, particularly clear and instructive, deserve a special mention.

Chapter III deals with "Applications of the Graph Theory in the Organization and Management of Production", particular stress being laid on the method of the critical path. This being the first detailed presentation of the method, the authors first expound the basic computation methods and notions, after which follows the original treating of some special problems such as: use of the critical path method in planning and following up works achieved in a chain, the computation of the duration for a *repetitive* work in a *probabilistic* model, as well as the planning of repetitive works. The part dealing with practical applications is clear and profusely illustrated with network graphs that enable the working methods to be assimilated.

Chapters IV — "Applications of the Theory of Expectative Sequences", V — "Optimization of Stocks", and VI — "Applications of Dynamic Programming", are concise but condensed accounts of some operational research methods of great theoretical and practical importance, but very little dealt with in our scientific literature.

The study of the theoretical material dealt with in these chapters implies some preliminary knowledge of modern mathematics. However, with the help of a few well-chosen examples, the problems become easily accessible under their practical aspect.

Chapter VII groups a series of operational research instruments which, although more seldom applied in practice in construction work, nevertheless display interesting prospects and contribute to broaden the horizon in this domain. The original treating of the section "Decision models" and of the section "Monte-Carlo methods", deserve particular mention.

This book, as a whole, has three main merits. The first is to offer a general presentation of the problems of operational research and its applications in construction, allowing the engineers, economists, other specialists in construction work, as well as the students, to become acquainted with this new domain and assimilate its methods in view of their practical application. In this sense the authors have succeeded in pleading with talent and enthusiasm in favour of assimilating what is new. The second merit of this book is the personal manner of treatment, the stress laid on a few new aspects of some problems and the original treating of others. Finally, the third merit is its close link with practice, the mentioning of numerous applications actually achieved, and the construction of suggestive examples.

We regret not to be able to appreciate as favourably the graphical presentation of the book, which is unsatisfactory. We consider that works like **"Operational Research in Construction"** deserve more care from the publishing houses with regard to the quality of the paper, print, binding and covers.

Dr. M. C. DEMETRESCU