Who could ask for more?

The appendices will probably prove to be of great use to particular students. The first describes the Dartmouth /GE system while the second describes the UWBIC (University of Washington) system. The rest of the book lists some useful programs written in BASIC.

All in all this is a fine book carefully thought out and prepared and deserves a good measure of success.

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39[12].—KEITH NICOL, *Elementary Programming and ALGOL*, McGraw-Hill Book Co., New York, 1965, viii + 147 pp., 24 cm. Price $6.50.

This hard cover book by Keith Nicol of the Edinburgh School of Computer Services is an honest attempt to present the fundamental principles of computers. These basic concepts are incorporated in the first four chapters but are written in a needlessly detailed fashion. To the uninitiated this could be most discouraging, and even for the initiated it makes for difficult reading.

The next three chapters deal with various hints on programming (a questionable practice since the reader still doesn't know what a program is all about), computer hardware and applications of computers. These chapters could have been omitted in large part since they do not add very much to the understanding of programming per se.

It is not until we arrive at Chapter 8 that we encounter the introduction to ALGOL programming itself which, according to the cover, is the principle purpose of the book—'a teach-yourself-programming book which will have a general appeal.'

The introduction to Algol is, indeed, clear and well planned but it lacks a sufficiently developed sequence of problems to satisfy most students. For this reason the book is not suitable for classroom use but rather for individual reading of a somewhat superficial nature.

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40[12].—JOHN H. FASAL, *Nomography*, Frederick Ungar Publishing Co., New York, 1968, xviii + 382 pp., 26 cm. Price $14.50.

With the enormous expansion in the use of large-scale digital computers, the impression is generally held that there is less need for nomography. A nomogram, however, is not really a computing device. Rather, it is a method of presenting the voluminous results of computing with two or more independent variables in a more useful and compact form. Therefore, the increase in the volume of available data reinforces the need for nomography.

In this century, the demands of nomography have inspired many ingenious mathematical techniques. Most of these are described in this book. They include the basic three-scale nomograms designated by III, V, and N (or Z) which represent three straight line scales that are parallel, concurrent, or N-shaped, respectively. Also included are the nomograms designed by ICC, IIC, and CCC, where I represents a straight scale and C represents a curved scale. Combinations of these are used when there are more than two independent variables. An important process, described here, is the transformation of a given function into "partial functions" which conform to the relations inherent in the basic nomograms.

Frequently, when two nomograms are combined, the functional scale at the end of one alignment does not have the desired shape or graduation distribution to begin the second alignment. A technique, developed by the author, called Tangent Line Alignment (TLA), makes use of an auxiliary curve which is the envelope of straight lines joining corresponding numerical values of the two scales. Hence, one can proceed from one scale to the next by drawing a tangent line to this curve. This speeds the process and reduces the probability of error associated with reading one scale and then entering the second scale by interpolation.

It is well known that not all functions can be precisely nomographed. However, since all technical data have limited accuracy, one can usually devise a nomogram with the desired accuracy. Similarly, it is shown that empirical data, which have no known precise mathematical expression, can be satisfactorily approximated.

A large portion of the book is devoted to the anamorphic transformations of the nomograms to produce scales that are more uniform, more readable, and which permit greater accuracy. This process, which has not received as much attention in other books, frequently distinguishes the skill of the expert from the labor of an amateur.

The thoroughness of the exposition of the detailed construction of nomograms makes this work the most practical book in English. To this same end, the more esoteric mathematical techniques have been omitted in favor of the simpler techniques, even though the latter sometimes may require more steps.

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