which caused it to stall is completed. When the loader finds this, normal operation is resumed.

The open end of the program (i.e. the space after the last instruction loaded) is blocked automatically by the loader to prevent the program getting ahead of the loader. This process thus makes maximum possible use of the simultaneous peripheral operation during loading.

When this process is applied to simulation programs it makes possible a one-pass compilation from the source language to absolute binary. (The CSL200 is a two-pass system only because of the small core size available.) C.S.L. allows the user to write his program in a number of sections—each corresponding to an activity in the process being simulated—each of which may occupy the whole core storage. Thus these sections must be executed cyclically. In this situation this assembly/loading process is of double benefit by considerably reducing both compilation and running time.

References

BUXTON, J. N., and LASKI, J. G. (1962). "Control and Simulation Language", *The Computer Journal*, Vol. 5, p. 198.
CLEMENTSON, A. T. (1965). Courtaulds All-Purpose Simulator Reference Manual (i.e. C.S.L. on the Honeywell 400).
Honeywell 200 Programmers' Reference Manual.
RANDELL, B., and RUSSELL, E. J. (1964). *ALGOL 60 Implementation*, Academic Press, London.

Book Review

Numerical and Matrix Methods in Structural Mechanics, by Ping-Chun Wang, 1966; 426 pages. (London and New York: *John Wiley & Sons Ltd.*, 110s.)

Books on structural theory, numerical methods and programming abound, but few attempt to cover all three subjects. It is, however, the integration of these which beginners often find difficult when they first use a computer. Consequently this book must be welcomed if only because it attempts to fill a genuine gap in the literature.

Seven of the book's eight chapters are divided four-three in favour of numerical methods (finite differences, partial differences, integration, and relaxation methods). The three chapters on matrix methods are devoted to matrix algebra, the force method and the displacement method. Chapter 8 contains annotated programs (written in FORTRAN) for the majority of the problems discussed in earlier chapters. An appendix gives brief details of FORTRAN—not sufficient to replace a manual, but enough to serve as a refresher course. A number of exercises are given for the reader to solve or program, but no solutions thereto.

There are many illustrative examples throughout the text. These are nearly all straightforward and as such do not always test the methods fully, so that the reader is left with no guidance for the more difficult problems he is sure to meet as soon as he essays a "real" problem. For example, in the chapter on partial difference equations, the torsional stiffness of a prismatic member is discussed at some length in both Cartesian and polar coordinates, but no mention is made of practical methods for use where the member has a longitudinal hole or re-entrant corners.

A similar lack of sophistication is apparent in the chapter on matrix algebra where the only method suggested for solving equations is first to invert the matrix of coefficients using the Gauss-Jordan method with a second array to hold the unit matrix and then premultiply the right-hand side by this inverse. Not only is this most wasteful of computer time, but it may frequently be impossible (without using a backing store) because of the size of matrix involved. Structures with thirty joints or more are common, and each joint may give rise to as many as six equations. Under these conditions it is imperative to use computationally efficient methods. The method suggested for setting up the stiffness matrix for a structure is also very cumbersome and space- as well as time-consuming.

The programs in Chapter 8 are very thoroughly documented, thus making them one of the best features of the book. Not only the data format but also the use to which all of the variables are put are described and in most cases a flow chart is given.

This is not, then, a book that can be recommended for advanced workers, though it does fill a definite gap for beginners.

H. B. HUMPIDGE

Erratum

In the paper "A compact storage scheme for the solution of symmetric linear simultaneous equations" by Alan Jennings (this *Journal*, Vol. 9, p. 281), we regret that Fig. 8 (p. 285) was inadvertently printed on its side. To be correct it should be turned through 90° anti-clockwise.