undertakes this by first presenting a 1-D linear acoustic analysis of the wave action and then concentrating on various forms of the method of characteristics (MOC). He acknowledges that the MOC has now been superseded by other numerical schemes for the solution of the 1-D equations of fluid motion, but makes the case that the use of separate positive and negative going wave-like components in the MOC aids the understanding of wave action.

The book is focussed solely on wave action, and pays most attention to the mathematics of the problem rather than the description of the physical process itself. As a result, there are no diagrams of engines or intake or exhaust systems in the book, and the practical concerns of optimizing engine breathing whilst controlling noise are hardly discussed. Notwithstanding this, the book will be of interest to those seeking a deeper understanding of wave action in ducts in general, an understanding that can subsequently be applied to IC engines in particular.

Chapter 1 sets out the governing equations of 1-D fluid motion. The notation used is clear and will be familiar to most readers.

Chapter 2 presents an acoustic analysis of the 1-D fluid motion. First the equations of motion are linearized. Then a general solution in the form of positive and negative going pressure and particle velocity is discussed. Later, the linear plane wave equation is derived, and the propagation of sound across simple discontinuities in the duct is analyzed. Acoustic impedance is discussed. The analyses in Chapter 2 is simple, which does aid rapid progress through the material, but also rather oversimplifies the problem by neglecting the influence of mean flow and temperature gradients.

Chapter 3 presents the foundations for the MOC along with instructions on how the graphical MOC can be used to solve the equations of fluid motion at a point for a simple wave making the homentropic assumption. The presentation style is clear, although the material may be found in other texts written before the demise of the graphical method brought about by the advent of popular computing.

Chapter 4 expands the use of the graphical MOC to deal with the interaction of many waves in a duct and the interaction with thermal discontinuities. Two simple boundary conditions are considered, these being the open and the closed end. The homentropic assumption is still retained.

Chapter 5 discusses the formation and propagation of single shock waves and Chapter 6 expands this to the interaction between several shock waves. Three simple boundary conditions are considered, these being the open end, the closed end and the thermal discontinuity.

Chapter 7 is a short chapter that considers the general form of the MOC and briefly discusses the main problems to overcome in developing a numerical rather than graphical MOC.

In summary, this reviewer found the book to be a clear treatment of a particular approach to modelling wave action in ducts that should promote a deeper understanding of wave like behaviour in readers fairly new to the subject.

M. F. HARRISON

FLOW-INDUCED VIBRATION, 2000, by Samir Ziada and Thomas Staubli (editors). Rotterdam: A. A. Balkema, xvi + 846pp. Price £83.00, US$ 125·00, EUR 125·00. ISBN 90-5809-129-5

This book is the Conference Proceedings of the FIV-2000 International Conference held at Lucerne Switzerland, June 2000. It's 846 pages contain 106 papers on structural vibration and acoustics in fluids by 222 authors from 20 countries. All of the papers have been reset in a two-column format and the figures are legibly large giving the volume a uniform professional appearance that rivals text books. The editors are to be congratulated for the high quality of the result.

The papers are divided into 13 topics: (1) vortex-induced vibration (14 papers), (2) rectangular sections (6 papers), (3) free shear layers (5 papers), (4) hydraulic structures (5 papers), (5) computational fluid mechanics (11 papers), (6) axial flows (9 papers), (7) biomedical (5 papers), (8) aero elasticity (5 papers), (9) heat exchangers (12 papers), (10) flow-induced sound (15 papers), (11) thermo-acoustics (5 papers), (12) turbo machinery and piping (5 papers), (13) rotor dynamics (4 papers), and (14) paper processing (5 papers). All of the papers are applications of experimental, theoretical, or numerical methods to problems in these areas of vibrations induced by fluid energy. Many of the papers are specific examples of engineering field problems. Three of the papers that I particularly enjoyed include G. J. Lyons (University College London) *et al.* measurements of the vortex-induced vibration oil production umbilical line in 400 m water off the coast of Norway. They found complex 0·1 to 0·2 diameter vortex-induced response due to vortex shedding but without a distinct peak. K. Anami and N. Ishii (Osaka Electro-Communication University) made experimental and analytical analysis of the 1995 failure of an 87 ton Tainter flow control gate at Folsom Dam in California, "A gate operator felt a small steady vibration start up very light and intensified very quickly and after a few seconds he saw the (whole) gate moving slowly to the downstream side." A hydrodynamic instability is held responsible. Finally, Y. B. Chang and P. Moretti (Oklahoma State University) describe the flutter like instability of sheets of paper moving at high speed between rollers. They develop an expression of the onset of aerodynamic instability.

The current range of troublesome and interesting flow-induced vibration problems and the state-of-the-art of their analysis are well described in this excellent conference proceeding. It is recommended both as a review of the art and as a source of examples of practical applications.

R. D. Blevins

DICTIONARY OF ACOUSTICS, 2001, by Christopher L. Morfey. London: Academic Press, xvi + 430pp. Price £43.95, $64.95. ISBN 0-12-506940-5

It would be trite to state that this is a nice handy dictionary, which differs from most other dictionaries in that its scope is limited to acoustics, and which all persons who work in acoustics should have (along with Rayleigh's *Theory of Sound* and a few other references on acoustics and related subjects) on their most accessible bookshelf. All this is of course true, but this particular dictionary goes far beyond what might be expected from a mere description of its scope, its number of entries, and its size. Indeed, it offers the world a new paradigm for how dictionaries on scientific subjects should be written.

The present reviewer is somewhat of a collector of dictionaries; the total number in his possession being of the order of 50. Almost all of these have been written by committees; a few are single authored. For those dictionaries that purport to be scientific dictionaries, those that were written by committees seem to be very uneven in the quality of their individual entries. Not every committee person is an extremely well-read person or an acknowledged writer of excellence, and what appears is often a result of a consensus of a group of opinionated individuals, not all of whose opinions are worth consideration. (The reviewer is willing to stick his neck out here and, with the customary mealy-mouthed prefatory phrase, "with all due respect," state that this criticism extends to the publication, American National Standard Acoustical Terminology, issued by the Acoustical Society of