Vibration Damping, by Ahid D. Nashif, David I. G. Jones, and John P. Henderson, John Wiley & Sons, Inc., New York, 1985, $51.50.

This is a clear, well-written book on the theory and application of viscoelastic damping for the control of vibration and noise problems in a wide variety of industrial structures and machines. The authors have drawn on their many years of research and practical experience in the field to gather together in one place a valuble summary of theory, design, and art of vibration damping. The book deals primarily with viscoelastic type dampers, although other types of damping such as coulomb friction, acoustic radiation, air, and structural material damping are briefly described. The complex modulus approach is used extensively to describe the viscoelastic damping properties and the resulting dynamic response.

The book is divided into seven chapters. Chapter 1 reviews fundamental concepts in vibration theory such as methods for predicting dynamic response in discrete and continuous structures, effects of damping, vibration control, isolation, and noise. Chapter 2 discusses damping mechanisms in general structures and materials, then focuses on the practical viscoelastic materials (polymers, elastomers, glasses) and the complex modulus approach to their characterization and response. Chapter 3 describes the behavior and typical damping properties of viscoelastic materials including effects of temperature, frequency, strain level, and other environmental factors. Chapter 4 describes the analytical response of systems with viscoelastic damping. Harmonic steady state, random, and transient responses of viscoelastic materials are examined for both linear viscous and general hysteretic damped properties. Simple and multiple degree-of-freedom systems are included. Chapter 5 describes the operation and behavior of discrete damping devices, such as tuned dampers, in simple and complex structures. Several actual case studies are included. Chapter 6 describes the operation and behavior of distributed damping devices such as surface laminate coatings for reducing vibrations in beams and plates. The Ross-Kerwin-Ungar equations are used extensively here, for both the unconstrained layer (extensional damping) and constrained layer (shear damping) type modes. Again, various actual case studies are included, as well as a discussion of experimental testing techniques. Chapter 7 gives data sheets for the complex modulus properties of thirty-four useful viscoelastic damping materials. Temperature and frequency effects are included.

The present book is a useful contribution to the literature, and should be valuable to all persons interested in vibration damping.

John Dugundji
Massachusetts Institute of Technology

Explosive Shocks in Air, by Gilbert F. Kinney and Kenneth J. Graham, (2nd edition), Springer-Verlag Inc., New York, 1985, 269 pp., $39.00.

Books on explosions and blast waves are not plentiful. Hence, any new book by experts with two decades or more of experience is certainly a welcome addition. The present book is an updated version of a previous one having the same title by G. F. Kinney (The Macmillan Company, 1962). The material which is covered is quite extensive and includes good introductory information on TNT and nuclear explosions and their characteristics and effects [Chapter 1]; basic textbook information on the thermodynamics of explosion processes [Chapter 2], characteristics of air [Chapter 3], and normal, oblique and reflected shock in perfect air [Chapters 4-5]; blast-wave formation and their detailed characteristics (time of arrival, amplitude, duration, shape, impulse) [Chapter 6]; scaling laws for blast waves in both uniform and nonuniform atmospheres [Chapter 7]; additional information on the characteristics of explosions and blast wave propagation [Chapter 8]; internal blast (fuel-air explosions in vented structures) [Chapter 9]; transient blast loading of simple shaped structures [Chapter 10] and their dynamic response [Chapter 11]. Also, at the back of the book, an excellent set of tutorial exercises with answers is given, and a collection of tabulated data on explosives, shocks, blast waves and their effects is included for easy use.

The authors have been successful in their goal of presenting "as simply as possible a general description of the basic nature of explosions." However, keeping the presentation simple and basic has nonetheless excluded important information that engineers and researchers in

the field of explosions require as part of their work and understanding. For example, all of the differential equations of detonation and blast-wave flows and their numerical methods of solution have been excluded, the treatment of oblique shock-wave reflections is incomplete in that only older work on regular and Mach reflection is discussed and much recent work, including complex and double Mach reflections, is missing. The blast-wave scaling laws are nonstandard, and the treatment of blast loading of structures is oversimplified in view of recent work using multi-dimensional computational prediction methods. Consequently, this introductory book should be most useful to nonexperts and researchers entering the field of explosions, in that they will quickly obtain a good grasp of the entire field without undue complications from mathematical and phenomenoogical details.

James J. Gottlieb
University of Toronto