**Principles of Turbomachinery,** by R. K. Turton, E. & F. N. Span and Mathus, Inc., New York, 1984, 199 pp., $37.00 HB, $17.95 PB.

This book is a welcome addition to the engineering literature. It is intended as a senior level text in turbomachinery. Topics in this book provide the guiding principles covering all forms of turbomachinery and also give a detailed analysis of the most common types from an engineering point of view.

The book can be divided into three parts. In Part One, the first four chapters, the author provides a general overview of turbomachinery. Chapter 1 deals with fundamental principles of fluid mechanics and its applications to both axial and centrifugal machines, shock wave effects, and cavitation. Chapter 2 covers principle and practice of scaling laws. Chapters 3 and 4 deal with axial flow and radial flow machines.

In Part Two, Chapters 5, 6, 7, 8, turbomachines are studied according to flow paths rather than by application. The author guides the reader through the analysis of centrifugal machines, trust load problems and solutions, axial machines for incompressible flow, axial turbines and compressors for compressible flow and radial flow turbines.

Part Three, Chapter 9, deals in detail with cavitation, solid suspensions, gas content, pumped storage system and a short discussion on the control of output.

Instructors will find more than ample material for a one-semester course. The book has 193 figures, and many example problems. However, missing from the text are photographs of the various types of turbomachines described throughout the book. The typical undergraduate student will probably find that uncomfortable. The instructor can always compensate for this deficiency. The practicing engineer will find the book a pleasure to read and also a very helpful reference book.

The reviewer's overall impression of the book is very favorable. The book is well written, and the organization and presentation of the material is excellent.

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**Solid Mechanics Research Trends and Opportunities,** Special Publication AMD-Vol. 70, ASME, New York, 1985.

In Fall 1983 the Applied Mechanics Division of ASME established a committee on Solid Mechanics Research Directions. The committee consists of M. M. Carroll (co-chair), R. M. Christensen, R. J. Clifton, D. S. Griffin, F. A. Leckie, F. C. Moon, and J. R. Rice (co-chair). It was charged with identifying and, to the extent possible, fostering promising future research directions in solid mechanics. Recognizing the somewhat fragmented nature of the field and its lack of strong visibility in may funding agencies, it seemed appropriate for the committee to assemble a report which surveyed the entire field, identified the important trends in modern solid mechanics research, and pointed to outstanding research opportunities for the future.

This report is the result and, as the following subsection will reveal, it has involved the active participation of many members of the solid mechanics research community. The report is divided into 15 chapters. Chapters 1 to 15 examine research in the mechanics of specific classes of materials or material systems, whether biological, geological, or technological (metals, polymers, composites). Chapters 6 to 9 address cross-cutting phenomena (fracture, waves and dynamic response) and methodology (experimental, computational) valid for all classes of materials and structures. Chapters 10 to 13 focus on modern structural mechanics research and some specific application areas in mechanical and electronic technology. Chapter 14 addresses mechanics research needs for modern processing and manufacturing technology. Finally, chapter 15 examines solid mechanics research overall, draws together recurring themes in the earlier chapters, and points to new and promising approaches on the foundations of solid mechanics. *Each chapter closes with a summary of research needs in its area.*

*J. R. Rice*
*Report Editor*