This book is designed to help the engineer understand the principles of metal forming and to analyze forming problems—both the mechanics of forming processes and how the properties of metals interact with the processes. In this book, an entire chapter is devoted to forming limit diagrams and various aspects of stamping and another to other sheet forming operations. Sheet testing is covered in a separate chapter. Coverage of sheet metal properties has been expanded. Interesting end-of-chapter notes have been added throughout, as well as references. More than 200 end-of-chapter problems are also included.

William F. Hosford is a Professor Emeritus of Materials Science and Engineering at the University of Michigan. Professor Hosford is the author of more than 80 technical articles and numerous books, including Mechanics of Crystals and Textured Polycrystals; Physical Metallurgy, Second Edition; Mechanical Behavior of Materials, Second Edition; Materials Science: An Intermediate Text; Materials for Engineers; Reporting Results (with David Van Aken); and Wilderness Canoe Tripping.

Robert M. Caddell was a Professor of Mechanical Engineering at the University of Michigan, Ann Arbor.
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Preface to the Fourth Edition

My coauthor, Robert Caddell, died in 1990, and I have greatly missed working with him.

The most significant changes from the third edition are a new chapter on friction and lubrication and a major rearrangement of the last third of the book dealing with sheet forming. Most of the chapters in the last part of the book have been modified, with one whole chapter devoted to hydroforming. A new section is devoted to incremental forming. No attempt has been made to introduce numerical methods. Other books treat numerical methods. We feel that a thorough understanding of a process and the constitutive relations that are embedded in a computer program to analyze it are necessary. For example, the use of Hill’s 1948 anisotropic yield criterion leads to significant errors.

I wish to acknowledge my membership in the North American Deep Drawing Research Group from whom I have learned so much about sheet forming. Particular thanks are due to Alejandro Graf of ALCAN, Robert Wagoner of the Ohio State University, John Duncan formerly with the University of Auckland, and Thomas Stoughton of General Motors.

William F. Hosford