

Overview

The 24th National Symposium on Fracture Mechanics was held 30 June to 2 July, 1992, in Gatlinburg, Tennessee, on the doorstep of the Greater Smoky Mountains National Park. In addition to the fine technical program and the evening social activities, the park bears gave unusual entertainment to the symposium attendees with their apparent free access to the hotel garbage facilities. The Symposium was sponsored by ASTM Committee E 24 (now E 08), with support from the University of Tennessee and the Oak Ridge National Laboratories.

The Symposium had an international flavor. Nine different countries were represented on the technical program with nearly one third of the presentations coming from authors outside of the United States. There was a very large participation from Japan; eight papers were presented by Japanese authors. This international participation added an important dimension to the symposium allowing the attendees to gain insight on the fracture work that has been going on around the world.

The book has been divided into nine topical sections; Jerry L. Swedlow Memorial Lecture, Constraint Issues, Ductile to Brittle Transition, Elastic-Plastic Fracture, High Temperature Effects, K Analysis, Applications, Fatigue, and Nonmetallic Materials. The Swedlow Memorial Lecture, presented by Professor Paul C. Paris of Washington University, St. Louis, looked at the impact that this symposium series has had on the progress in fracture mechanics research. As originator of this important series, Professor Paris is uniquely qualified to judge its merit. It is now more than a quarter of a century since the first symposium was held at Lehigh University in June of 1967. The hundreds of authors from past symposia form a Who's Who of fracture mechanics. Many of the important new advances in the subject were first published in the STPs that resulted from these symposia. Some of these papers have been cited hundreds of times in the literature.

The central themes of this symposium were constraint issues and nonlinear fracture mechanics. These are covered in the next four sections. The number of papers dealing with the two-parameter fracture mechanics approach to constraint and its impact on transition fracture toughness show that it is currently the most active topic of study. Much of the work on transition fracture toughness came from a round robin program sponsored by the Materials Properties Council (MPC) and the Japan Society for Promotion of Science (JSPS). Dr. Martin Prager of MPC assisted with the organization and review of these sessions. The sections on elastic-plastic fracture and high-temperature effects mark a continuing interest in the nonlinear fracture mechanics areas.

The topics on K analysis, applications, and fatigue come from a more traditional interest area in fracture. The K analysis forms the very core of the fracture mechanics approach. Applications are the ultimate goal of the fracture mechanics research. The renewed interest in fatigue at the National Symposium is perhaps in anticipation of the cooperation between these two areas with the recent merger of the ASTM Committees E 09 on fatigue and E 24 on fracture into E 08 on fracture and fatigue. Finally, the section on nonmetallic materials indicates that this area is one for which much of the future work on fracture and fatigue will be directed. Interest in

fracture of nonmetallic materials is broadly based including work on polymers, ceramics and composite materials.

A high point in the symposium was the Awards Banquet at which the Irwin metal was presented to Professor Ashok Saxena of the Georgia Institute of Technology and the ASTM Award of Merit was presented to Professor James A. Joyce of the Naval Academy. These were presented by Mike Hudson, then Chairman of ASTM Committee E 24. The members of the organizing committee should be acknowledged. These include John Landes and Don McCabe, Cochairmen, Toby Boulet, Rick Link, Janis Keeney, Karl-Heinz Schwalbe, Ed Wessel, Ashok Saxena, Ted Anderson, and Al Van Der Sluys. Finally, the staff of ASTM helped with the conduct of the symposium and the development of this STP. These include Dorothy Savini, Pat Barr, Kathy Dernoga, Lynn Hanson, Therese Pravitz and Kathleen Peters.

John D. Landes

University of Tennessee

Knoxville, TN; symposium cochairman and
coeditor.