

read for anyone who lives in conflict-ridden societies and is groping for solutions. Through this book Gould's powerful personality and humanism make a lasting impression on the reader's mind – truly a parting gift from a great mind.

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Fracture Mechanics for Modern Engineering Design. K. R. Y. Simha. Universities Press (India) Ltd, 3-5-819 Hyderguda, Hyderabad 500 029. 182 pp. Price: Rs 225.

Damage tolerance-based design has become mandatory in all the safety-critical, high-technology structural components. The science behind this approach – fracture mechanics – is highly interdisciplinary and has been growing rapidly over the past three decades. Before the 1960s, it was a challenge for the elasticians to develop solutions which take care of the presence of cracks (due to free surfaces formed in a material). Later, it required a combination of analytical and experimental scientists in structural and material sciences to investigate the criteria which can predict crack growth in a material, finally leading to failure due to fracture. The major question posed for the designers and operators is how to identify the existence of a crack, and monitor its growth so that catastrophic failure can be avoided. One could visualize its importance in vehicles such as aircraft, helicopters, railway bridges, dams, multi-storeyed buildings. Besides structural, fatigue and fracture analysis, sophisticated instrumentation, closed loop control and smart systems are required to ensure component integrity in these high-technology structures.

Obviously a total coverage of all sciences required for damage tolerance analysis in a single book is a stupendous task. The book under review covers best the classical theory of elasticity solu-

tions, which are not found in such detail in many books. A good background in this area is essential for both undergraduate and postgraduate students in various mechanical and aerospace disciplines. The width of total coverage in the book is broad. The author touches upon dynamic fracture, fracture control plan, plasticity effects and mixed-mode fracture, so that a student-reader gets a gross picture of the field. However, details in many areas are missing (some of them are essential); but this is understandable since this is a small textbook for a field which is interdisciplinary and growing rapidly. I cannot help but comment that numerical analysis for estimating stress intensity factors has surprisingly received little attention from the author – not even to the extent of coverage on experimental methods. I would have also expected a more reasonable exposition of practical problems, case studies in design and operation and ageing structures/aircraft.

Both students and designers need to supplement a lot from other books and journals. The book, however provides a reasonable bibliography to help the reader. I am also impressed with the number of worked-out examples and exercises provided at the end of each chapter.

In summary, I would recommend this book to those who are planning to enter into the field of fracture mechanics at both academic and design levels.

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Statistics in Genetics and in the Environmental Sciences. Fernholz, L. T. *et al.* (eds). Birkhauser Verlag, P. O. Box 133, CH-4010, Basel, Switzerland. 2000. 183 pp. sFr 98/DM 130.

This book comprises a collection of 12 papers presented at a Workshop on Statistics and the Sciences held in Ascona, Switzerland in 1999. All papers relate to problems of genetics or the environ-

mental sciences in a broad sense, including atmospheric chemistry, debris in space, etc. There is a wide variation in the quality of the papers. Some of the papers are highly theoretical and are only tangentially related to real-life problems, while several others actually start with a real-life problem and then proceed to develop statistical methodologies for solving the problem.

The problems of genetics that have been dealt with statistically comprise several frontline areas of research, including quantitative genetics, microarrays, assignment of offspring to parents using molecular markers and carcinogenesis. Similarly, several frontline areas of research in environmental sciences have also been addressed from a statistical viewpoint, including estimation of parameters for distribution of chemical concentrations, risk assessment of carcinogen exposures, ozone layer breakdown, air pollution and space-debris risk assessment.

The nature of statistical treatment of problems included in the papers is also highly variable. Some of the papers are superficial and discuss statistical methods as implemented in some software packages, without providing any details of the methods themselves. This is a deplorable trend. Some other papers assume that the reader is conversant with details of the scientific problem introduced by the author(s) and then quickly jump to provide statistical solutions. Thus, there is no consistency in scope, style or level across chapters. I must, however, state that most of the papers actually present some new statistical methodology, and are not confined to use of routine or standard statistical methods in the sciences. Most papers are not self-contained. Therefore, the reader will need to spend a great deal of time in studying earlier publications, before being able to comprehend the papers presented in this collection. I did this with respect to two of the chapters of immediate professional interest to me, and was rewarded.

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