Understanding tensile fracture in rocks provides an important key for the interpretation of many problems in structural geology. This book presents a multidisciplinary approach to tensile fracture in rocks (faulting is only briefly addressed), starting with an introduction to fracture physics and progressing through tectonofractographic features, characterized both in experimental settings and in geological outcrops. Four fracture provinces of sedimentary rocks and four fracture provinces in granites have been chosen to demonstrate the principles and problems in fracture geology. Principles of fracture mechanics are presented and applied throughout the book, which also explores current understanding about electromagnetic radiation induced by fractures and how such radiation can be used to monitor microcracking and hazardous collapses in mines, that may lead to earthquake prediction. The monograph serves not only as a manual on how to handle specific problems and their solutions in fracture geology but also as a starting point for researchers and graduate students interested in the field of rock fracturing.