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Sommario/riassunto	This monograph is concerned with free-boundary problems of partial differential equations arising in the physical sciences and in engineering. The existence and uniqueness of solutions to the Hele-Shaw problem are derived and techniques to deal with the Muskat problem are discussed. Based on these, mathematical models for the dynamics of cracks in underground rocks and in-situ leaching are developed. ContentsIntroductionThe Hele-Shaw problemA joint motion of two immiscible viscous fluidsMathematical models of in-situ leachingDynamics of cracks in rocksElements of continuum mechanics