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§1. INTRODUCTION

During the past decades the *mathematical* theory of nonlinear three-dimensional elasticity has undergone a considerable renewed interest, reflected for instance by the books of Marsden and Hughes [17], Ciarlet [8], and the book reviewed here.

The existence results available at the present time fall in two categories:

In one approach (described in §§2 and 5) the problem is posed as a *system of three quasilinear partial differential equations of the second order*, together with specific boundary conditions (cf. (13)), and one tries to obtain "*local*" *existence results based on the implicit function theorem*; this approach, which was initiated by Stoppelli [18], is the central theme of the book under review.

In another approach (described in §§3 and 4), the problem is posed as a *minimization problem for the associated energy* (cf. (20)), and one tries to adapt the paraphernalia of the calculus of variations (infimizing sequences, weak convergence, weak lower semi-continuity, etc.) to this problem, which is "highly nonconvex"; this approach is the basis of a famous existence result of Ball [3].

All these results apply to "static" equilibria, i.e. to problems that are *time-independent.* While substantial progress has thus been made in the study of statics, the mathematical analysis of time-dependent three-dimensional elasticity still meets with inextricable difficulties. The proofs of the available existence results "for large