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## Chapter 10

### INTERNAL FRACTURES IN SOLIDS OF REVOLUTION

#### DUE TO STRESS WAVE FOCUSING

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*Internal fractures in spherical, paraboloidal, hyperboloidal and elliptical solids subjected to concentrated surface explosive loading are investigated. The initiation and growth of the internal fractures are associated with the focusing effect of P and S wave fronts reflected from the curved boundaries. High speed photography on perspex specimen is used for the verification of predictions of simple methods of geometrical optics and propagation of discontinuities. The speed with which these internal fractures grow are found to depend upon the geometry of the surface of the solid.*

#### I. INTRODUCTION

Research on spallation of bars and scabbing in plates due to stress wave reflection is well documented in the literature. Much work has been carried out on stress wave reflection from flat boundaries and, in consequence, the investigations were mainly concerned with fractures produced due to tensile stress produced by either the reflection of a single wavefront, or the interaction of two or more reflected wavefronts. Many examples of such work may be found in Rinehart and Pearson (1), Kolsky (2), Johnson (3), and Al-Hassani et al (4). Work concerned with fractures due to stress wave focusing, however, is rather meagre. Focusing of waves usually occurs as a result of reflection from or transmission across a curved boundary.