

Another common phenomenon is the «ridge fracture»: any corner in a shocked sample may be neatly split, except near the outermost tip, where common shear fracture normally occurs, Fig. 27. These have been discussed in detail by RINEHART and PEARSON [14] and by FOWLES and ANDERSON [15]. The latter have performed a linear elastic analysis of the configuration shown in Fig. 28 and 29. In Fig. 28 the line labelled Φ represents a compressive wave

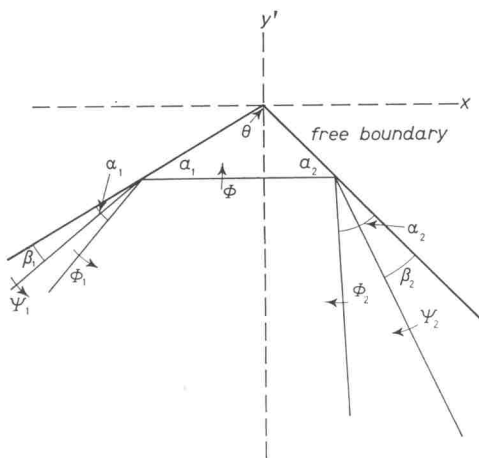


Fig. 28. - Wave incident upon corner. (From ref. [15]).

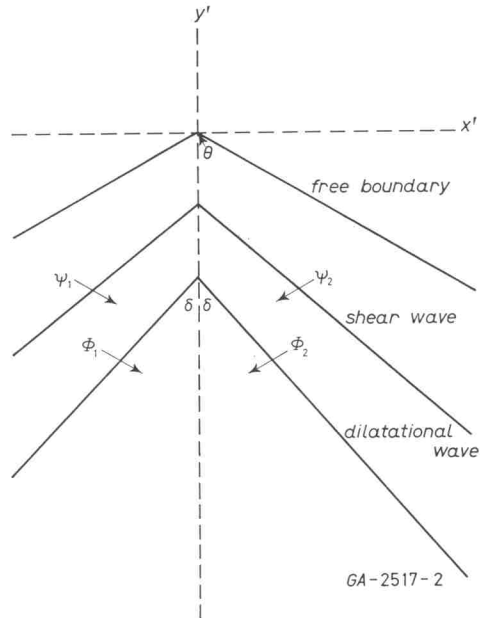


Fig. 29. - Interaction of reflected waves. (From ref. [15]).

running into a corner, generating reflected dilatation and shear waves Φ_1 , Φ_2 , and ψ_1 , ψ_2 , respectively. At a later time, shown in Fig. 29, only the reflected waves remain, and these meet along the dotted axis labelled y' , the points of intersection running down as time progresses. The interacting tensile waves, Φ_1 and Φ_2 and/or shear waves ψ_1 and ψ_2 produce a fracture running along y' if the amplitude of the incident wave is sufficiently great. Their analysis, which agreed reasonably well with experiments, indicated that, for a given incident wave, the maximum fracture stresses were developed for $\theta \simeq 120^\circ$. The shear fracture near the corner in Fig. 27 is very likely due to the finite time required for fracture, as in eqs. (100)-(102).

An interesting type of fracture occurs when a layer of explosive is detonated in contact with a metal plate. The situation is characterized in Fig. 30. In Fig. 30 a) the detonation front is travelling with speed D across the surface

of the plate, inducing a trailing shock, \mathcal{S} . Pressure on the plate falls quickly behind the detonation front as indicated. This produces a corresponding rarefaction behind \mathcal{S} . The shock \mathcal{S} is reflected from the bottom surface as a rarefaction, \mathcal{R} , and the interaction of \mathcal{R} with the rarefaction behind \mathcal{S} produces a tension stress field which may be strong enough to fracture the plate along

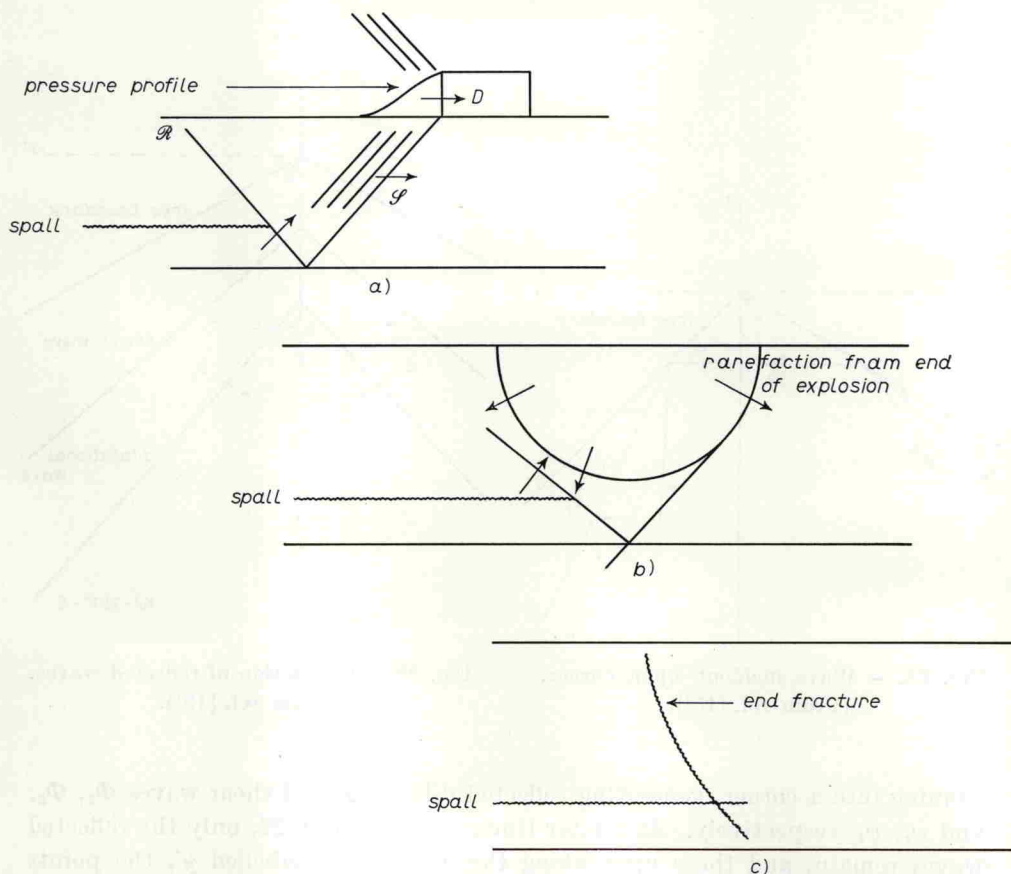


Fig. 30. - Generation of end fracture. *a)* Steady waves from detonating explosive; *b)* rarefaction generated at end of explosive intersects with bottom rarefaction; *c)* end fracture resulting from interaction.

the surface labelled «spall». When the detonation reaches the end of the explosive charge, a rarefaction is generated with a more or less circular wave front as shown in Fig. 30 *b)*. This rarefaction, interacting with \mathcal{R} , produces a stress field which results in an end fracture with orientation shown in Fig. 30 *c)*. The geometry of this interaction has been worked out [16], but no one has