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 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 $\theta \simeq 120°$. 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).

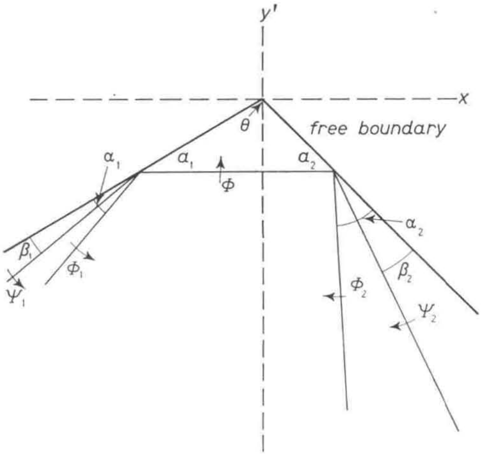

Fig. 28. – Wave incident upon corner. (From ref. [15]).

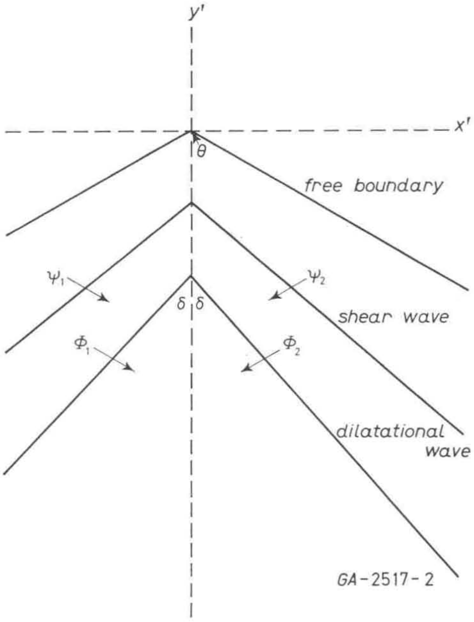

Fig. 29. – Interaction of reflected waves. (From ref. [15]).

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

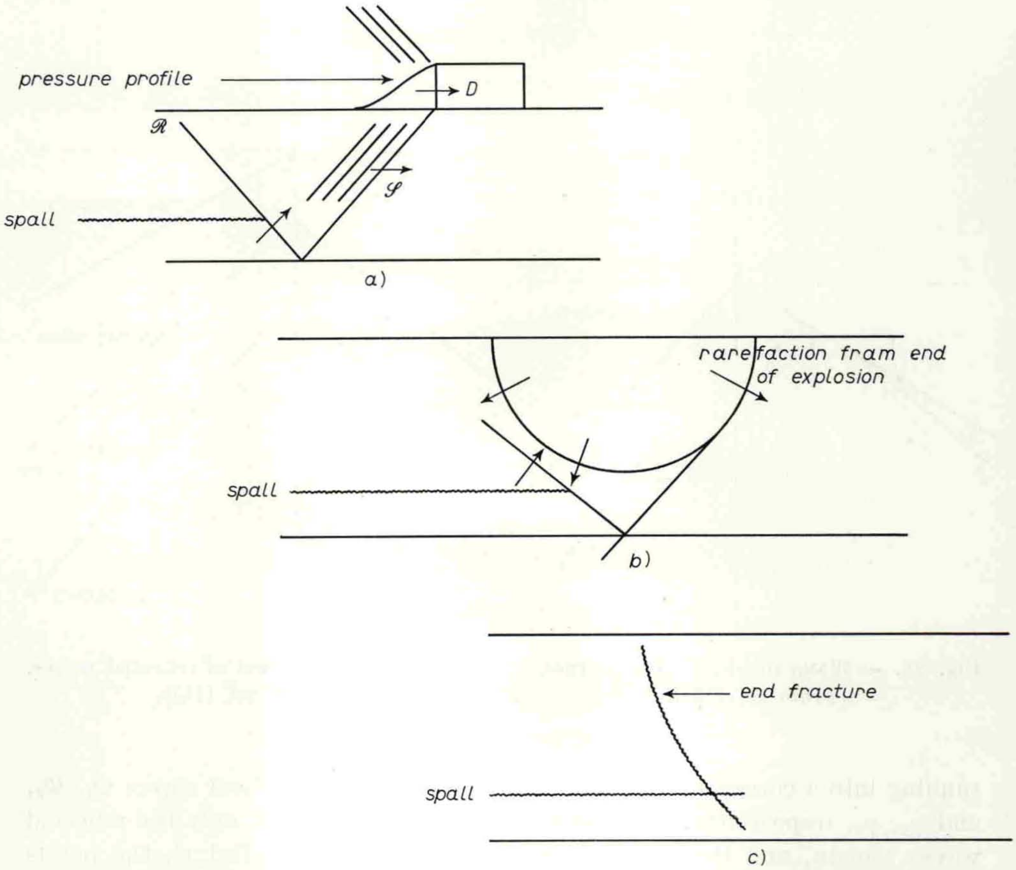

Fig. 30. – Generation of end fracture. *a*) Steady waves from detonating explosive; *b*) rarefaction generated at end of explosive intersects with bottom rarefaction; *c*) end fracture resulting from interaction.