transition. The usual explanation for the two-wave structure in solids is a solid-solid transition[24, 25] in which the material transforms from one crystal structure to another. A two-wave structure in liquids is not easily explained, however. Usually a liquid-solid transition or vice versa does not produce a large enough change in volume and consequently the two-wave structure may not be observable. The transition may be due to a sudden change in the number of nearest neighbors, polymerization upon compression, or the solidification of the liquid as the pressure is applied and then a solid-solid transition occurring.

D. Interaction of a Shock Wave with an Interface

The collision of a shock wave with an interface between two media has not only theoretical importance, but important experimental application. The basis for describing this interaction is that the particle velocity and pressure are continuous across the interface and the conservation relations are valid. Consider the case in which a plane shock wave collides at normal incidence with an interface between two media. Fig. 4 illustrates the situation before and after collision for two cases involving differing media. The expressions relating the pressures and particle velocities for the two media will be derived in a form such that the left-going wave can be either a reflected shock or a rarefaction wave. The relative impedances (initial density times the shock velocity) determines which condition prevails. Application of continuity across the interface yields

$$P_2 = P_3 \tag{17}$$