Another method that could be used is based on X-ray diffraction in the press.

Let us examine for a moment the change in eutectic melting temperature with pressure. Kaufmann[47] has proposed the equation:

$$\frac{dT_E}{dp} = \left(\frac{\Delta V}{\Delta H}\right) T_E \qquad (8)$$

where T_E is the eutectic temperature at one atmosphere, and ΔH and ΔV are the overall enthalpy and volume changes at the eutectic. This is simply a modification of the Clapeyron equation, but suggests that one could likewise obtain the enthalpy associated with the eutectic behavior on melting at a given pressure, if the volume change were known. Extension of this concept to the meritectic is obvious.

Two problems are apparent. First, it does not seem possible to get ΔV values except by using a piston cylinder arrangement or X-ray apparatus. Secondly, there are problems associated with obtaining accurate latent heats of fusion at high pressures. The main difficulty is the heat leak from the sample to the press and surroundings. Another difficulty is the rounding of curves of the melting point as a function of pressure at the higher pressures. In almost all cases, the melting curves for the various compositions rise with increasing pressure. Such behavior suggests that the liquid phase usually has a larger volume than the solid phase and that heat is absorbed in the melting process. In the region of meritectic composition, the curvature of the melting curve (Figures 20 through 24) originating with the meritectic