mine the exact transition pressure with this apparatus. An examination of the structure of Ag_3Sn using a high pressure x-ray diffraction apparatus is planned to see whether a phase transition is actually occurring.

Bridgman[6] (1935) has examined the compressibilities of several intermetallic compounds as a function of pressure. The striking characteristic in his data is the large number of volume discontinuities detected and the observance of such irregularities as creep and hysteresis. This behavior is expected since intermetallic compounds are not strict chemical compounds. Often large superstructures are formed since the interatomic linkages are not as strong as true chemical bonds. Since γ-Ag_3Sn has an orthorhombic superlattice, formed from a slightly deformed hexagonal close packed structure, there is a possibility that the structure returns to the hexagonal close packed lattice at high pressures. A detailed x-ray determination of structure at high pressures will be necessary to fully determine the characteristics of the transition if a structure change is taking place.

There is also a possibility that the transition reflects an electronic rearrangement. Murphy[7] reported that γ-Ag_3Sn undergoes a transformation at about 60°C at atmospheric pressure and that the nature of the transformation was not known. Preston[8] showed by x-ray diffraction methods that the lattice did not change during this transition.

γ_2-$HgSn_{7-8}$

The transformation suggested in the γ_2 data appears to occur in the range 15-20 kb. Although an x-ray diffraction study of the structure at high pressures is necessary to determine whether the structure actually changes, structural transitions can be suggested from the work of Raynor and Lee.[9]

γ_2 is a tin-rich solid solution. Raynor and Lee have shown how the simple hexagonal lattice of γ_2 could be formed from the body-centered tetragonal