That the pressure generated with the composite gasket assembly shown in Fig. 2 is sufficiently hydrostatic for ordering experiments is demonstrated by comparing the resistance changes in a cold worked sample of Cu_3Au held at constant pressure and slowly heated with the changes in an annealed sample treated the same way. The annealed sample shows a steady increase of resistance with temperature due to disordering and to the thermal component of the resistance; the previously cold worked sample shows a resistance decrease as the cold work is annealed out under pressure and then shows the same resistance-temperature as the initially annealed sample.

THE CRITICAL TEMPERATURE FOR ORDERING

The order-disorder transformation in Cu_3Au is of the first order, i.e., is characterized by a discontinuity in the volume and entropy at the critical temperature, T_c, above which long range order no longer exists. As an ordered alloy is heated, the long range order decreases slowly and continuously until T_c is reached at which temperature the remaining long range order vanishes. The critical temperature can be conveniently observed by means of resistivity measurements: If the sample is heated slowly and is at a uniform temperature throughout, there will be a discontinuity in the resistance *vs.* temperature curve at T_c. Determination of T_c is made most effectively by a heating curve; when the disordered alloy is cooled through T_c considerable supercooling is often observed. This is because the transformation to order is accomplished by nucleation of ordered domains.