a function of pressure in Fig. 3 for the measurement whose T_c results are plotted in Fig. 2. We clearly see the irreversible increase in the residual resistance

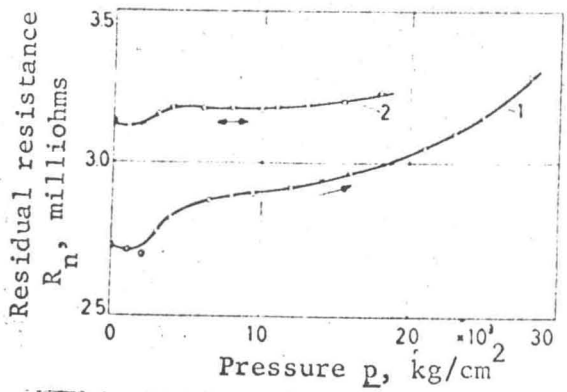

Fig. 3. Variation of residual resistance with pressure for the specimen shown in Fig. 2.

when pressure is first applied to the specimen annealed at room temperature. The reversible variation of resistance with pressure is very slight. It should be stressed that annealing at room temperature causes the additional irreversible resistance to vanish for the most part.

In order to check whether the observed variation of the transition temperature with pressure is affected in any way by the lattice defects that are responsible for the high residual resistance of unannealed specimens, we also utilized specimens that had been brought up to residual resistance ratios of about $1.5 \cdot 10^{-3}$ by annealing in ultrahigh vacuum.

The results of such a test are shown in Fig. 4. In this case, the shaped cell was chilled, and then a pressure of $25 \cdot 10^3$ kg/cm^2 was applied in one step (solid dot). The load was then removed, and pressure was reapplied, yielding Curve 1. In these specimens as well T_c is raised irreversibly by the initial deformation after chilling. This rise can be eliminated completely by re-annealing at room temperature. After this specimen had stood at room temperature for

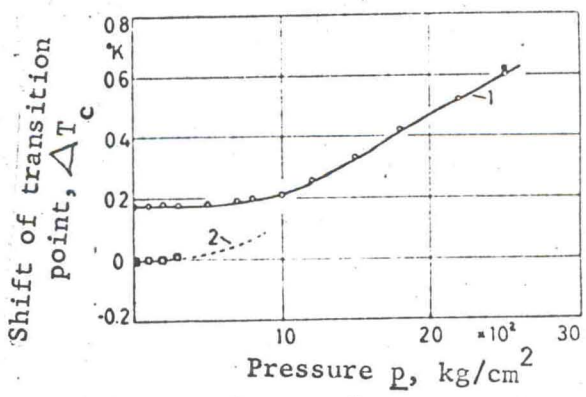

Fig. 4. Variation with pressure of the transition temperature of an Nb specimen whose residual resistance ratio was small. $R_n/R_{273} = 1.5 \cdot 10^{-3}$.