artifacts of the experiment, it is tempting to ascribe the structure as due to time-dependent behavior of the silver resistivity. This behavior will be discussed in Sec. IV.I.

The last shot, 73-059 at 119 kbar (Fig. A.1 (m)) was done in order to see how closely a point on the MRC-annealed ρ versus P curve could be reproduced; all other MRC-annealed shots had been done before the W3N shots. So the last shot tested whether the difference between the W3N and MRC data could be due to subtle variations in experimental procedure over the course of time; the result was somewhat ambiguous. The data point for this shot agrees with other MRC data. As on the other shots, the point corresponds to the resistance level 0.5 μsec after the shock arrives at the foil. The overall voltage-time profile, however, is quite unlike the earlier MRC shot at 115 kbar. The earlier shot showed a fairly steady level for the 0.5 μsec while 73-059 peaks strongly at 0.2 μsec. Shot 73-059 is also unlike the W3N shot at 117 kbar, although the structure in the first 0.2 μsec has some similarity.

Shot 73-040 (Fig. A.1 (b)) was atypical in that there is a 10 nsec initial positive spike followed by a negative signal for 30 nsec; this is attributed to epoxy polarization signal. This shot had a wedge-shaped epoxy layer between the foil and sapphire pieces as thick as 15 μm, much thicker than that of the other shots where the epoxy signal would be too fast to be resolved.

Record 73-056 (Fig. A.1 (s)) is anomalous in that voltage levels are high and do not level off. Foil stretching (lateral tensile deformation) due to non-planar impact could cause this. Appendix B discusses the resistance change due to stretching; resistance change should increase as time squared. Anomalous behaviors of 73-051 (Fig. A.1 (r)) and especially 73-056 are approximately of this form.

D. Isothermal Results

Because the shock process raises the silver temperature by an amount depending on shock strength, it is necessary to convert the shock resistance change data to isothermal resistivity before comparing it to hydrostatic experiments and theory. Conversion was done using calculations of temperature and temperature coefficient of resistance described in Chapter III.

Since the voltage-time profiles were not square pulses, some judgment was necessary in picking representative values for use in plotting data. The best-characterized point on the profile seemed to be at the end of the viewing window, 1/2 μsec after shock arrival at the foil. Since on many records a more or less steady level had been reached by this time, this value was used for computing ρ/ρ_0 data points.

Isothermal resistivity of silver as a function of compression is shown in Fig. 10. All shock data lie well above the calculated hydrostat. The data point at 27 kbar lies slightly above Bridgman's hydrostatic results to 30 kbar. Shock results for different purity silver also differ among themselves. There may be a small effect of annealing prior to shocking in the data (Fig. 11) for the less pure silver.