are reduced, but the effect of silver purity on defect concentrations is increased.

An experimental indication of heat flow effect may be present in shot 73-047 at 94 kbar. The W3N foil was thinned down to 17.6 μm from the 24.4 μm thickness of the other W3N foils; the isothermal resistivity data point without heat flow correction is indeed slightly high (Fig. 11). Heat flow correction according to Table 3.2 would bring the data point in line with the other W3N points.

It should be noted that, in addition to other uncertainties in the calculation, the differential equation used may not completely describe the physical situation. The differential equation is a diffusion equation and neglects thermal waves which may be generated by the steep temperature gradients. Morse and Feshbach (1953) note that a more correct description would be given by the differential equation

$$u_{xx} - \frac{1}{C^2} u_{tt} = a^2 u_t \quad .$$

Solutions for this equation were not obtained.

K. Work on Recovered Silver Foil

Silver foils recovered after impact experiments were studied by observing resistance changes on annealing and by optical and electron microscopy.

Pieces of silver foil up to 0.8 cm long and 0.25 cm wide were recovered in air in four shots; the shots were 73-009, 73-010, 73-013 on MRC silver and 73-044 on W3N silver. The impactor-target assembly, decelerated by nylon rags, was recovered with the silver and sapphire fragments trapped inside. Sapphire fragments were no larger than 0.2 cm. Significantly large areas of foil were found which had not been scarred by the final deceleration of the fragments. The silver was subjected to some lateral relief waves but most of the pressure was relieved by the rarefaction wave from the epoxy-sapphire interface behind the backing sapphire disc (Fig. 1 and 2). While the state of the recovered foils was affected by the relief and deceleration processes, it may give some clues to the nature of the shocked state.

A simple annealing study was made of the resistance of a foil piece recovered from shot 73-010 shocked to 87 kbar. The preshock value of the resistance ratio between liquid helium temperature and room temperature was 0.00438. As recovered, two different foil pieces gave postshock values of 0.0222 and 0.0220, five times larger than the preshock value. For shot 73-013 (27 kbar) the preshock value was 0.00376; the postshock value was 0.0178, 4.7 times as large.

The preshock resistance at 4.2°K should be due mainly to impurities. The difference between the postshock and preshock values should be due to lattice imperfections remaining after the shock process. For shot 73-010 the resistance-ratio difference is 0.0178; for 73-013, 0.0140.

A piece from 73-010 was subjected to anneals. The results are given in Table IV.

The table shows that annealing at less than 100°C caused almost no change in the imperfection resistance; if anything,