compression. These results give the first quantitative indications of defect concentrations generated during shock compression, and confirm what was qualitatively expected from previous work. The results show higher defects concentrations for more pure silver. The two shots on unannealed, cold-rolled foil indicate a shock-induced defect concentration slightly higher than that in annealed silver of the same purity.

II. EXPERIMENTAL PLAN AND PROCEDURE

Design of the experiment to measure resistance changes in metals due to shock compression involved (1) choice of a particular metal for study, (2) developing a configuration of impactor and target to ensure uniaxial compression of the metal, (3) choosing a recording system for monitoring the resistance changes, and (4) developing a specimen preparation sequence which produced uniform, well-characterized samples.

A. Choice of Material

In terms of doing a basic study of resistivity of a metal under dynamic pressure, one wishes to choose a metal which typifies metallic behavior and in as many ways as possible behaves according to simple theories.

Two requisites then were that it have no phase transitions in the pressure range to be studied, and that it be available in high purity. Another requisite is that the experimental static pressure response of its resistivity should behave at least qualitatively according to the predictions of a Debye-Mott model (Mott, 1934) for changes due to compression in the electron scattering by lattice vibrations. Preferably the resistivity change under pressure should be large for ease in accurate data gathering.

One might initially think that alkali metals would be prime candidates. Aside from the fact that they are not easily