0 to 25 kbars. The belly cross-section derivative is comparable to a nearly-free electron calculation of $\frac{d\ln A_F}{dP} = 0.602 \times 10^{-3}$/kbar (Brandt et al., 1972). The total neck cross-section increases at a faster rate than the belly cross-section. Extrapolation to 100 kbar implies a 40% increase in neck cross-section as compared to a 5% increase in belly cross-section. This is compared to a 6% increase calculated from a nearly free electron model. From handbook values of sizes of neck and belly cross-sections one finds that although the total neck cross-section goes from 4.0 to 5.4% of the net Fermi surface area, the net Fermi surface area itself increases by about 3.4% in going from ambient pressure to 100 kbar. From our simple model, $\rho \propto S^{-1}$, we would expect a decrease in resistivity with pressure. This is opposite to the direction of the effect predicted by Dugdale (1961) at low temperatures where electron scattering by long wave length phonons is enhanced by neck distortion. The present calculations also contradict the volume dependence of the lumped parameter A(V) in the semi-empirical approach which will be used in the present work.

For $\rho \propto S^{-1}$

$$\left(\frac{\partial \ln \rho}{\partial \ln V}\right)_T = \frac{d\ln S}{dP} B_T + \text{ other terms}$$

where β_T is the isothermal bulk modulus, we know that $\frac{d\ln S}{dP}$ is nearly constant to 25 kbar. But β_T is about 30% larger at 100 kbar than at 1 atmosphere, so that $\frac{d\ln S}{d\ln V} = \frac{d\ln S}{dP} \beta_T$ is by no means constant.

It should be noted that the effect of uniaxial tension on the Fermi surface of silver has been measured (Shoenberg and Watts, 1967). The neck cross-section increases strongly, $\frac{d\ln A_2}{d\sigma} = 15 \times 10^{-3}$/kbar while the belly cross-section decreases, $\frac{d\ln A_1}{d\sigma} = -0.3 \times 10^{-3}$/kbar. A 2 kbar elastic limit corresponds to a neck cross-section change of 3%, a small effect compared to the 40% hydrostatic effect at 100 kbar.

In some cases electronic transitions can occur on compression (Drickamer, 1965). A lower lying electron energy band may be raised above or overlap the conduction band, changing the electronic properties. No such effects have been observed in noble metals.

From all these considerations, lumping these volume dependences into a parameter A(V) in Eq. (2) such that $\frac{d\ln A}{d\ln V}$ = constant over the compression range studied here should be a fair assumption, as long as the dominant volume dependence of the resistivity is contained in the volume dependence of the characteristic temperature, $\theta(V)$.

3. Volume Dependence of Impurity Resistivity

It would be desirable to account for the pressure derivative of the impurity resistivity ρ_i for each purity of silver used. Goree and Scott (1966) found that a silver specimen which was twice as pure as another specimen had an impurity pressure derivative one-half as large. Using this proportionality we can find the approximate impurity pressure derivatives