

tude in the lattice vibrations (which has no counterpart in  $\xi$ ) we are left with the quantity  $\partial \ln K / \partial \ln V$ . A comparison between this quantity and  $\xi$  shows that the two are approximately proportional to each other. This is illustrated in Fig. 22. This figure shows not only the

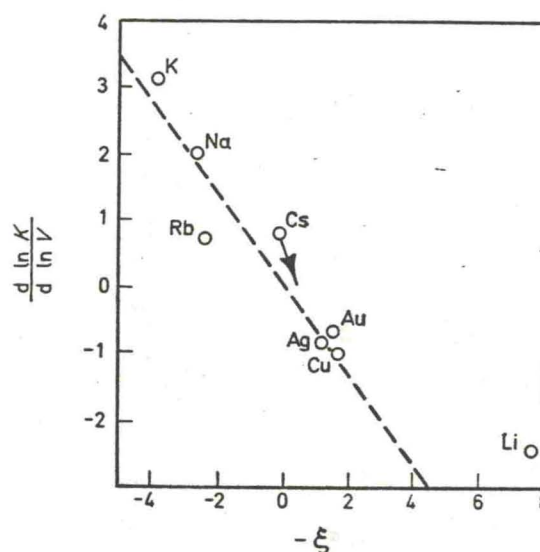


FIG. 22. Relationship between volume coefficient of  $K$  and thermoelectric power. Note that  $-\xi$  is plotted. (From Dugdale and Mundy, 1961.)

values of  $\partial \ln K / \partial \ln V$  and  $\xi$  for the metals under *normal pressure*, but, for Cs, it shows values for the compressed metal. The approximate proportionality is still valid (Dugdale and Mundy, 1961).

A possible interpretation of this relationship is as follows. Assume that the electrical conductivity  $\sigma$  is a function only of the Fermi energy,  $E_F$ , the Debye temperature of the lattice,  $\theta$ , and the temperature,  $T$ , i.e., we write  $\sigma = \sigma(E_F, \theta, T)$ ; likewise the resistivity  $\varrho = 1/\sigma$  depends on the same variables. Then:

$$-\left(\frac{\partial \ln \varrho}{\partial \ln V}\right)_T \equiv \left(\frac{\partial \ln \sigma}{\partial \ln V}\right)_T = \left(\frac{\partial \ln \sigma}{\partial \ln E_F}\right)_{\theta, T} \frac{d \ln E_F}{d \ln V} + \left(\frac{\partial \ln \sigma}{\partial \ln \theta}\right)_{E_F, T} \frac{d \ln \theta}{d \ln V} \quad (45)$$

This equation can be reduced on the basis of the following simplifying assumptions: