ıly raised in energy. Those
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onance is so broad as to be
ered as the principle origin
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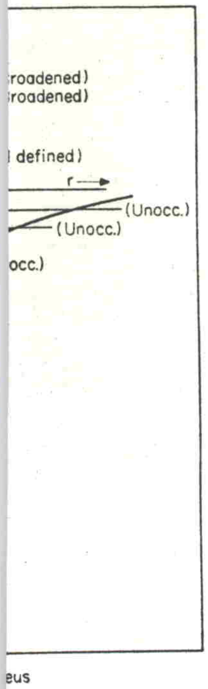

ion in a metal. The free-ion levels
orresponding levels in the metal
the unexcited free atom. (From

d rather crudely as follows.
energy would be *bound* in the
may be thought of as bound
he continuum. The potential
mory" of the free-ion poten-

The main effect of pressure is to alter the Fermi level. Pressure also alters the screening and hence the height of all the energy levels of the ions, but this second effect is slight. In Cs, the effect of compression is to raise the Fermi level towards the d resonance corresponding to the empty d bound state of the free ion. This accounts for the gradual enhancement of the d phase shift on compression (see Fig. 25). Likewise in Li, the p resonance has a dominant effect on the phase shifts. Similar though less conspicuous effects occur in the other metals.

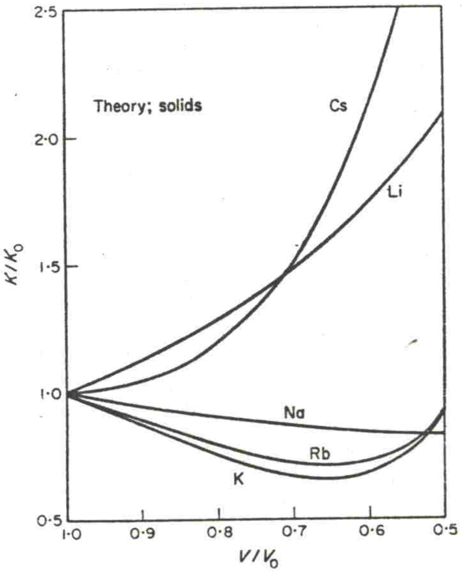

FIG. 27. Calculated K versus volume in the alkali metals (from Dickey *et al.*, 1967) to be compared with Fig. 24.

As Dickey *et al.* point out, their discussion is in some ways similar to the point of view put forward by Fermi and verified quantitatively by Sternheimer (1950) to account for the phase transition found in Cs by Bridgman at about 45 kb pressure.

We return now to the calculation of electrical resistivity. It is clear from equation (47) for the resistivity scattering cross-section, that if one phase shift is large compared to the others, this tends to produce a high resistivity. The detailed calculations of the change of resistivity with volume for the whole alkali metal series confirm this and show how the rise in resistivity under compression in Li at all volumes and in Cs after slight compression are reproduced by theory (Fig. 27). In