boundaries. Likewise in Li,
arge and comparable to that
; in K the Fermi surface is
still very close to a sphere;
Rb, the distortion amounts
ıra and Templeton, 1965) to
., 1964) the Fermi surface is
xperiments; these indicate a
We see, therefore, that the
ion among the alkali metals,
t too close. One might, there-
ssure dependence: i.e., that
ly correct, but might over-
hat the Fermi surfaces of Li
e to change under pressure.
ence on these two metals is
er, Ham's calculations have
changes of resistivity under

ırface of Cu at atmospheric
the low-lying fully occupied
e. Segall emphasized that the
sp energy bands depends on
tion. It is particularly strong
tion can occur its effect is illus-
ar that if the Fermi level lies
ted with the *d* levels, the effect
rve of the *s* like electrons in
ompared to the free electron
ble metals tends to be pushed
areas around the [110] direc-
rticularly conspicuous in Au
, one electron per unit cell has
surface, this inward bulging

implies that the surface must bulge out in some other directions. Because of the energy gap at the [111] zone faces and because these faces lie close to the undistorted Fermi sphere, the Fermi surface tends to bulge towards these faces. This, together with the [110] concavities, forces the Fermi surface actually to contact these [111] zone faces. It is significant that the area of contact is greatest in Cu, which has the highest *d* levels, next greatest in Au and least in Ag, which has the lowest lying *d* levels.

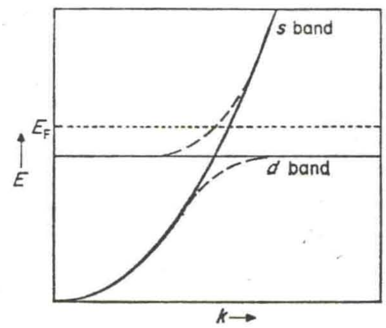

FIG. 15. The effect of interaction between *s* and *d* bands (schematic).

On this basis one may conjecture that the influence of pressure on the Fermi surface of the noble metals will make itself felt most strongly through the *d* electrons. On compressing the metal, the *d* bands would be expected to broaden in energy, and their mean energy to rise.† This will increase the effects of the interactions between *sp* like and *d* like energy bands, which in turn would exaggerate the distortion already referred to. Consequently one would expect that pressure would increase the areas of contact in the [111] directions and enhance the concave areas in the [110] directions. The experimental results of Templeton show that, at least as far as [111] directions are concerned, these ideas correspond with what is found experimentally. There have recently appeared some calculations of the effect of volume change on the Fermi surface of copper by Davis *et al.* (1968).

† A rough argument is as follows. Compressing the metal increases the overlap of the original atomic *d* orbitals. Consequently the *d* band will broaden on compression. A rise in the average band energy may be attributed to the increase on compression of the exponentially varying repulsion between the closed shells.