s k_F is related to E_F by the

(7)

as the interatomic distance.
the Fermi surface would be
i radius.
conduction electrons of the
interaction of the electrons
makes itself felt only when
lar direction coincides with
electron wavelength propa-
rillouin zone structure of the
tor of a conduction electron
zone to a point on the zone
ragg condition for reflection
he particular zone boundary.
tant energy must be contin-
e can discontinuities appear.
otential, the constant energy
s to their connectivity at the
t is convenient to map back
he surface that overlap into
ents in the third zone and so
ni surface, corresponding to
when re-mapped. Harrison
of doing this mapping and
sheets of the Fermi surface
ious lattice structures with
the atom.
given in Fig. 5, which shows
mi surface of a simple square
, 1960). The reciprocal lattice
urface is now a circle and the
Brillouin zone as seen in the
first sheet or band (i.e., the
vn by itself unchanged; the
v been re-mapped back into
ne scheme and represents the

same information as in (a) but differently displayed; with suitable labelling either is complete and unambigous. In (c) are shown the first and second bands in the *repeated zone* scheme, which brings out the possible continuous orbits accessible to an electron on any particular sheet (or band) of the Fermi surface. In (d) is shown Harrison's construction for deriving the reduced and repeated zone schemes.

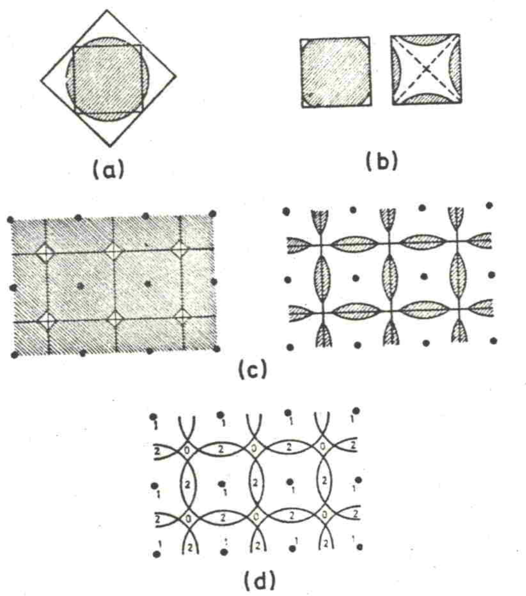

FIG. 5. (a). Fermi surface and first two Brillouin zones in the extended zone scheme. (b). First and second bands in the reduced zone scheme. (c). First and second bands in the repeated zone scheme. (d). Harrison's construction to derive the reduced and repeated zone schemes. (After Jan, 1966.)

In a cubic material the effect of hydrostatic pressure on the Fermi surface can easily be pictured to this degree of approximation. The pressure decreases the volume of the metal in real space and so in k space increases the volume, *but not the shape*, of the Brillouin zone. The volume of the Fermi sphere is changed in exactly the same proportions as that of the zone and so there is no relative change of Fermi sphere and Brillouin zone. So to this approximation pressure does not alter the relative size of different parts of the Fermi surface; everything scales.

In a hexagonal metal, such as Zn, however, the situation is different. Now pressure has the effect of altering the c/a ratio of the metal so