the alkalis, his choice of the expansion for the wave vector k overestimates the degree of warping. We expect that the Fermi surface will bulge towards the nearest zone face, which in the case of the alkalis lies in the 110 direction in the reciprocal lattice. However, an expansion in terms of fourth-order Kubic harmonics can only give bulging towards the 100 faces (if A is positive) or towards the 111 face (if A is negative). On the other hand, if sixth-order Kubic harmonics are included in the expansion, the desired bulging in the 110 direction can be obtained. Furthermore, it turns out that the effect of the Y_6 terms on the magneto-resistance coefficients is more than ten times that of the Y_4 terms. This has been shown by the work of Olson and Rodriguez who expanded the energy at the Fermi surface, rather than the wave vector, in Kubic harmonics [36]. They used

$$E = \frac{\hbar^2 k_o^2}{2m^*} \left[1/2 \left(\frac{k}{k_o}\right)^2 + r \left(\frac{k}{k_o}\right)^4 Y_4(\theta,\phi) + rt \left(\frac{k}{k_o}\right)^6 Y_6(\theta,\phi) \right] \quad \text{(I-4)}$$

as an expression for the constant energy surface; m^* is an effective mass, k_o is the radius of a sphere in k space which contains one electron per atom, and r and t are warping parameters. The values of Y_6 in the three principal directions are:

$$Y_6(100) = 1, \quad Y_6(110) = -\frac{13}{8}, \quad Y_6(111) = \frac{16}{9} .$$

Although this approach is similar to that of García-Moliner, it has the advantage of eliminating parameters like A' from the final expression for the magneto-resistance coefficients. Furthermore, Olson and Rodriquez compute all three coefficients, allowing an expression for the transverse magneto-resistance of a polycrystal to be obtained directly, without any assumptions about the ratio of the longitudinal to transverse magneto-resistance. By using García-Moliner's expression for $\bar{B}_t$, the transverse magneto-resistance of a polycrystal, along with the results of Olson and Rodriquez we obtain

$$\frac{\Delta\rho}{\rho H^2} = \bar{B}_t = \left[\frac{R}{\rho}\right]^2 \left[48.9\, r^2 - 7.15\, r^2 t + 750\, (rt)^2 \right] \quad \text{(I-5)}$$

where R is the calculated (free electron) value of the Hall constant and ρ is the resistivity at the temperature of the experiment. R is expressed in ohm-cm/ gauss and ρ in ohm-cm. Since t, as obtained by fitting the expression (I-4) to Ham's E(k) curves, is of the order of unity, it is clear that the terms from Y_6 contribute far more than those from Y_4. In Table I-1 we give the values of $|r|$ obtained by fitting the expression (I-5), with the approximation that t may be set to 1, to Moliner's values of $\bar{B}_t$. The values of ρ are taken from Kittel [37]; the values of R from Mott and Jones [38]. The values of the parameter r that we obtain indicate considerably less warping than is obtained from the expansion (I-2), even though A and r are not directly comparable.

The behavior of the low temperature thermopower has been used by Ziman to make some estimate of the anisotropy of the Fermi surface in the alkalis [39]. The thermopower, Q, is defined by:

$$\vec{E} = Q \nabla T \qquad (I-6)$$

where $\vec{E}$ is the electric field in a metal and ∇T is the temperature gradient. On a free electron picture Q should be negative, approximately proportional to T, and small, of the order of .1 microvolt/ ^{o} C. at 10^{o}K. Measurements on the alkalis show that at low temperatures Q can be either positive or negative or can even change sign with temperature, that it is not always linear in T, and that it may be of the order of several microvolts/ ^{o} C. The large size of the effect at low temperature is due to the fact that the phonon distribution is not in equilibrium and contributes to the thermopower [40]. Bailyn pointed out that the sign of the lattice contribution to the thermopower can be either positive or negative [41]. This is because of the role played by umklapp processes in the lattice thermopower. The lattice power calculated by Ziman is proportional to $-\langle \vec{s} \cdot \vec{q} \rangle$ where the $\langle\ \rangle$ indicates an average over all electron-phonon interactions, $\vec{q}$ is the phonon wave vector, and $\vec{s}$ is given by:

$$\vec{s} = \vec{k} - \vec{k}' = \vec{K} + \vec{q} \qquad (I-7)$$

$\vec{k}$ and $\vec{k}'$ are the initial and final electron wave vectors and $\vec{K}$ is a reciprocal lattice vector. If $\vec{K} = 0$ we have a normal process, $\vec{s}$ is parallel to $\vec{q}$,