### 3. *Oscillatory Ettinghausen–Nernst Effect*

This method was used by Balain *et al.* (1960) in their work on the Fermi surface of Zn under pressure. The Ettinghausen–Nernst coefficient $B_{EN}$ (see, e.g., Jan, 1957) is defined by the relationship:

$$B_{EN} = -E_y/H\left(\frac{\partial T}{\partial y}\right) \tag{3}$$

In this is it supposed that, with no current flowing in the $x$ direction, a magnetic field, $H$, is applied along the $z$ axis. A temperature gradient $\partial T/\partial y$ is established along the $y$ axis, and an electric field $E_y$ in the $y$ direction is then observed (it is determined from the potential difference across the specimen in the $y$ direction divided by the corresponding thickness of the specimen).

The oscillatory part of the coefficient $B_{EN}$ arises from the quantization of the conduction electron orbits in the field, $H$, and their passage through the Fermi level as in the de Haas–van Alphen effect.

The oscillations are likewise periodic in $1/H$ and their period, $P$, is given by:

$$P = 2\pi e/A\hbar \tag{4}$$

where $A$ is the extremal cross-sectional area of the Fermi surface normal to $H$.

### 4. *The Fermi Surface of Zn under Pressure*

A comparison of the results from these different methods as applied to Zn has been made by O'Sullivan and Schirber (1966) and is shown in Fig. 3. This refers to the extremal cross-sections of the needles in Zn with the magnetic field parallel to $b_3$ (see Fig. 4); it illustrates that the de Haas–van Alphen measurements are in very good agreement with those from the oscillatory magneto-resistance measurements of Schirber (1965). Both these sets of measurements used the helium gas technique. Moreover, the results from these measurements are strongly corroborated in two different ways:

(a) The initial slope is in close agreement with that found by Balain *et al.* (1960) who used truly hydrostatic pressures transmitted by liquid helium. Moreover, O'Sullivan and Schirber themselves used the liquid-helium technique (up to 140 b) to check the pressure