where $t(P)$ is the linear dimension of the alkali metal as a function of pressure, $V(P)$ is its volume, and $V_H(P)$ is the normalized Hall voltage. $V(0) = t(0) = 1$. $t(P)$ corrects for the change of Hall voltage due to the change of thickness of the sample under pressure and $V(P)$ corrects for the change of electron density under pressure. The values of $V(P)$ are taken from Bridgman's compressibility data [2,3]; the values of $t(P)$ are computed from $V(P)$. n^* is normalized to unity at atmospheric pressure.

The curves of n^* for lithium and sodium shown in Figs. 3 - 10 and 11 were computed from the average of the least square slopes of V_H vs. pressure for the four sodium samples and two lithium samples. The curves of n^* for potassium, rubidium, and cesium, shown in Figs. 3 - 12, 13 and 14, were obtained from values of V_H read from the curves for specific samples. This was done as a matter of convenience, as we were interested in fitting the general shape of the n^* vs. pressure curve and for this purpose the curve for a typical sample was sufficiently accurate. In the case of potassium, where the Hall voltage curves differed between samples, we give n^* for the same two samples III-99 and III-115 whose curves of V_H vs. pressure appear in Fig. 3 - 4. These curves indicate the direction, size, and range of the effect in potassium, but because of the limited reproducibility their details cannot be considered meaningful.

B. Hall Voltage and n^* vs. Temperature

Figure 3 - 15 shows n^* vs. temperature for lithium. The values of n^* are computed directly from the measured values of V_H by using the value of the thermal expansion coefficient given by Bridgman [2]. All the points were taken as temperature increased, since when the heater was on, the nitrogen boiled away too rapidly to permit a series of points at decreasing temperatures to be measured.

Table 3 - 1 shows the values of normalized Hall voltage at room and nitrogen temperatures for sodium, potassium, rubidium, and cesium. Values of n^* are also given except for the case of cesium, where no value of the thermal expansion coefficient is available [4].

C.   Absolute Values of n^*

In the course of interpreting the results we became concerned with the absolute value of n^*; in particular we noticed that the literature values of the Hall constant for sodium and potassium gave n^* greater than unity (Table 1-1). We expected, for reasons that will be given in Sec. IV, that n^* should be less than one and decided to compute the absolute value of the Hall constant from our data where possible. In Fig. 3-16, 17, and 18 we plot $2V_H$ vs. the reciprocal sample thickness for lithium, sodium and potassium. In fitting a straight line to the points we gave more weight to those points corresponding to thick samples, since the relative error in the thickness of these samples is less.

Table 3-2 lists the free electron calculated values of the Hall constant, the values of Hall constant obtained from the slopes of the lines in Figs. 3-16 to 3-18, and the values of n^*. For convenience we also include the values of n^* corresponding to the literature values of Hall constant, which have already been tabulated in Table 1-1.

We believe the electrical portion of our measurement is accurate to better than 2 percent; the accuracy of the voltage measurement is about 1 percent and the current and magnetic field measurements are each accurate to better than 1/2 percent. The thickness measurement, accurate to .001", gives a 10 percent error on the thin (.010") samples and an error of less than 5 percent on the thicker (.020" to .050") samples. Since the latter were favored in fitting the data, we estimate the error due to the thickness measurement as 5 percent. The overall accuracy of the measurement is 7 percent. The literature values of n^* from the work of Studer and Williams [5], who quote an accuracy of 6 percent for sodium and 5 percent for potassium, disagree with ours. We shall discuss the reasons for expecting n^* to be less than unity in Sec. IV.