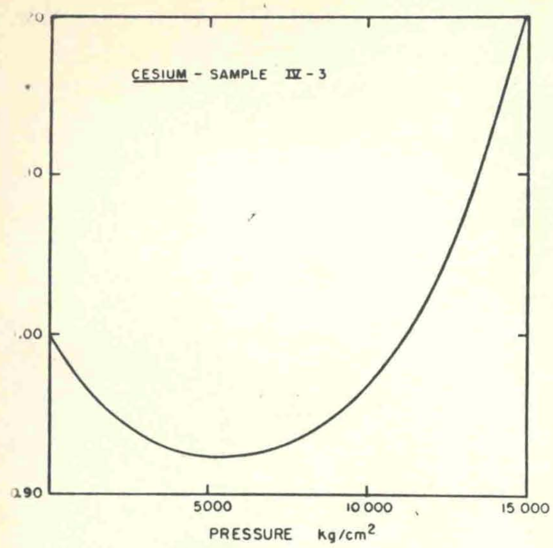

G. 6. n^*, normalized electrons/atom vs pressure for cesium.

e curves for lithium and sodium, where the pressure ect was both small and linear, were computed from average of the least square slopes of V_H vs pressure two lithium samples and four sodium samples. The rves for potassium, rubidium, and cesium were obned from the values of V_H read from curves for cific samples which, except for potassium, were well roducible. Since we were interested in fitting the pe of the n^* vs pressure curve the extra precision to gained by doing a least squares fit of all the data to uadratic curve was not needed.

Figure 7 shows n^* vs temperature for lithium. The ues of n^* are computed from the measured values of using Bridgman's[5] values of the thermal expansion. ble I shows the values of V_H and n^* at room and uid nitrogen temperatures for sodium, potassium, bidium, and cesium; n^* is not given for cesium ause no value of the thermal expansion coefficient available.

In the course of interpreting the results we become erested in the absolute value of n^*; in particular we iced that the literature values of the Hall constant

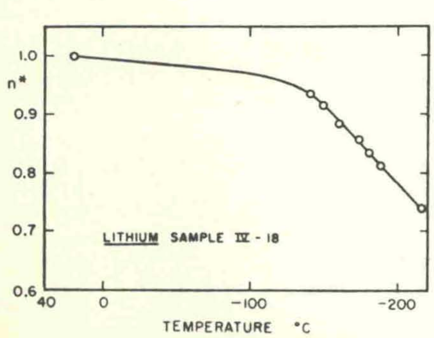

FIG. 7. n^*, normalized electrons/atoms vs temperature for lithium.

TABLE I. Hall voltages of four alkali metals at room and liquid nitrogen temperatures.

Metal	Temp.	V_H Normalized	n^* Normalized
Cesium	R.T.	1.000	
	77°K	0.973	
Rubidium	R.T.	1.000	1.00
	77°K	0.971	1.00
Potassium	R.T.	1.000	1.00
	77°K	0.981	0.98
Sodium	R.T.	1.000	1.00
	77°K	1.000	0.97

for sodium and potassium[16] gave n^* greater than unity. As we expected, for reasons that will be given in the discussion, that n^* should be less than unity we decided to compute the absolute value of the Hall constant from our data where possible. Figure 8 shows $2V_H$ vs the reciprocal of sample thickness for sodium, lithium, and potassium; the slopes of these plots were used to obtain the Hall constants. Table II lists the values of R and n^* obtained, along with values of R calculated on a free electron basis and values of n^* calculated from published data on lithium,[17] rubidium,[18] and cesium.[16]

The electrical portion of the measurement is accurate to better than 2%, since the accuracy of the voltage measurement is about 1% and the current and magnetic field measurements are each accurate to better than ½%. The thickness measurement, accurate to 0.001 in., gives a 10% error on (0.010 in.) samples and an error of less than 5% on the thicker (0.020 in. to 0.050 in.) samples. Since the latter were favored in fitting straight lines to the points shown in Fig. 8, we estimate the error due to the thickness measurement is 5%. The over-all accuracy of the measurement is 7%. The accuracy of the previous Hall measurements is given as 6% for sodium and 5% for potassium,[16] so that the disagreement falls outside of experimental error.

TABLE II. Hall constants of the alkali metals.

	Li	Na	K	Rb	Cs
$R_{calc.}\times 10^{13}$ $\frac{\text{volt-cm}}{\text{amp-gauss}}$	13.5	24.5	46.5		
$R_{exp}\times 10^{13}$ $\frac{\text{volt-cm}}{\text{amp-gauss}}$	15.5	25.8	49.0		
n_{exp}^*	0.87	0.95	0.95		
n^* from literature values of $R-$	0.79	1.17	1.11	0.94	0.98

[16] F. J. Studer and W. D. Williams, Phys. Rev. **47**, 291 (1935).
[17] A. v. Ettingshausen and W. Nernst, Ann. Physik **29**, 343 (1886).
[18] E. Krautz, Z. Naturforsch. **5a**, 13 (1958).