Although the data on potassium were not as reproducible from sample to sample as the sodium data, and the decrease in V_H at a fixed pressure is not an entirely satisfactory way of describing the curve, we include these data because of the large number of runs and the wide range of thicknesses covered.

The resistance versus pressure curve for potassium was anomalous insofar as it consistently differed from the data of Bridgman [1]. Our value of .4 for the normalized resistance at 15,000 kg/cm^2 is in sharp disagreement with Bridgman's value of .22. Figure 3 - 6 shows a typical curve of normalized resistance vs. pressure for potassium, as well as the data of Bridgman.

We suspected that our sample holder might be acting as a constraint on the compressible potassium and decided to repeat Bridgman's experiment, which used a free wire of potassium. We made a potassium wire by extruding the metal through a brass die and attached four Be-Cu contacts. Although difficulty with the contacts caused sample current fluctuations and made it impossible to get accurate curves, the value of the normalized resistance at 15,000 kg/cm^2, .4, was confirmed.

As the behavior of resistance versus pressure was the same for a free wire and for a sample mounted on our holder, we concluded that our sample holder was not constraining the specimens and that the Hall voltage data obtained with it were representative of free samples of alkalis. The fact that the rubidium resistance data, discussed below, are in substantial agreement with Bridgman's results even though rubidium is more compressible than potassium also indicates that the sample holder is not acting as a constraint.

Figure 3 - 7 shows a typical Hall voltage curve for rubidium. After sample preparation techniques had been revised so as to avoid working oxide into the metal, reproducibility was good. The final data are based on two samples used in a total of five runs; in four of these runs the decrease of V_H in 15,000 kg/cm^2 was between 12 percent and 13 percent while in the fifth it was 9 percent. All the ac data on rubidium were taken before the sample preparation techniques had been improved and show the same lack of reproducibility as the early dc data.

Figure 3-8 shows a curve of normalized resistance vs. pressure for rubidium as well as the data of Bridgman for bare wires of this metal. The resistance data sometimes showed hysteresis, but the shape of the curve agrees with Bridgman's work. Many runs were made before we learned to make clean, one-piece, samples which gave reproducible Hall voltage data; the resistance data, on the other hand, were much less sensitive to the method of making the sample. Thirteen runs on various rubidium samples gave an average normalized resistance at 15,000 kg/cm^2 of .35 with an rms deviation of .036. It should be pointed out that one can have hysteresis in the resistance curves without having it in the Hall voltage curves, since any slight tearing at the Hall leads changes the effective spacing between the voltage probes and thus the measured IR drop. The Hall voltage depends only on the thickness of the sample and will not show hysteresis because of tearing. The location of the voltage probes, appropriate for a Hall measurement, gives probe spacing comparable to the probe size and is not a good geometry for resistance measurements. In view of this, the agreement with Bridgman's data is satisfactory.

A typical Hall voltage curve for cesium is shown in Fig. 3-9. Two samples were used and a total of six runs performed. The measurements were at approximately $14^{o}C$. The normalized Hall voltage at 15,000 kg/cm^2 was between .61 and .64 for all six runs and a well defined curve was obtained. The rms deviation on intermediate points is about 1.5 percent.

The resistance of cesium under pressure exhibited considerable hysteresis and it was only after several runs on the same sample that the resistance minimum found by Bridgman became apparent. Because of the hysteresis the data could not be checked quantitatively against Bridgman's data; the shape of the curve was in agreement with his work. The possibility of tearing the sample Hall leads is even greater here than in rubidium, since the compressibility is greater.

The curves of n^* vs. pressure were obtained from the experimental curves using the relation

$$n^* = \frac{V(P)}{V_H(P) \ t(P)} \qquad \text{(III-1)}$$