Bridgman [14] measured the volume and electrical resistance of cesium as a function of pressure. He found a volume discontinuity at 22 kilobars, doubtlessly a first order transition to a cubic close packed structure. There is a further large volume discontinuity at 41 kilobars accompanied by a very definite cusp in the electrical resistance. Sternheimer [15] has suggested that the bands arising from the 5d shell lower in energy with pressure vis-a-vis the 6s band, and that the events at 41 kilobars are associated with the transfer of the conduction electron from the 6s to the 5d band. Sternheimer assumed a single, spherically symmetric d band so that his calculations cannot be rigorously correct. Recently Ham [16] has shown that the situation must be somewhat more complicated. Nevertheless, the notion of this "electronic transition" is probably sound and very intriguing.

Very recently [17] we have measured the electrical resistance of rubidium and potassium to very high pressures. Figure 9 shows the results for rubidium at 77°K and 296°K. There is a sharp rise in resistance at 190-200 kilobars, and a maximum beyond 400 kilobars. These events show no lag at 77°K which is consistent with the notion that this is an electronic transition rather than a diffusion controlled rearrangement.

In rubidium the separation in energy between the 5s and 4d atomic states is much larger than the 6s-5d splitting in cesium, so that it is reasonable that it would take a higher pressure to effect the electronic promotion.

The 3d energy in potassium is even further above the 4s state so that one would expect any electron transfer to occur at very high pressure. Figure 10 shows the resistance-pressure curves. The resistance at room temperature rises by a factor of 50 in 600 kilobars. It seems