discontinuities corresponding to the positive sloping phase line reported and it seems unlikely that the transition would not show up as a resistance discontinuity at elevated temperatures. The transitions observed resistively in the present work were sharper at high temperatures and were much less sluggish than the room temperature BaI-BaII transition. The triple point observed in the present work is found to occur at about 35 kb, 700°C, approximately where the fusion curve of Jayaraman, et. al.[1] shows a slight break in slope. Recent high pressure x-ray studies by Barnett, Bennion and Hall[8] indicate that the barium body-centered cubic structure changes to hexagonal-close packed structure at 59 kb, i.e., at the BaI-BaII transition. It should be noted that no evidence of the 17 kb resistance transition reported by Bridgman[2] was observed in the present work.

If, indeed, our negative sloping curve is the BaI-BaII transition line, then an important conclusion of the present work is that the fusion curve determined above about 35 kb is that of BaII. The fusion curve has a negative slope which continues to the highest pressures achievable in our apparatus and if extrapolated to higher pressures would cross the room temperature line in the vicinity of 140 kb. It is thus quite possible that the resistance transition near 144 kb and 25°C corresponds to melting.

Resistance vs. temperature curves for the various phases of barium are shown in Fig. 2. The transitions corresponding to melting and the BaI-BaII transformation are indicated. It is seen that