(MacDonald & Mendelssohn 1950); (*b*) a peculiar temperature dependence of ρ_i at quite high temperatures interpreted as due to a phase transformation (Bidwell 1924); and (*c*) a step-like anomaly at ~ 150 °K (MacDonald 1952). We have observed none of these anomalies; the resistivity appears to vary smoothly with temperature down to the lowest temperatures measured (~ 2 °K).

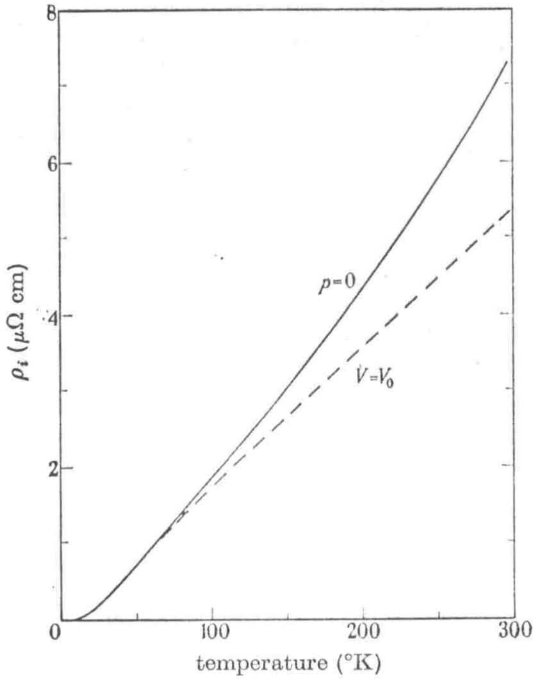

FIGURE 1. The ideal electrical resistivity of potassium as a function of temperature: ——, at effectively zero pressure; – – –, at a constant density equal to that at 0 °K under zero pressure.

The results of other authors are compared with ours in table 3. It is clear that our values are systematically lower than those found in earlier work. We believe that the difference is real and that it and the anomalies found by other workers are due to the constraining effects of the capillary tubes which were used to contain the specimens in their experiments. We discuss this question in detail elsewhere (Dugdale & Gugan, to be published) and conclude that in both potassium and sodium this effect can readily explain the discrepancy. We also conclude that for accurate work, capillary specimens are not satisfactory.

3·1·2. *The dependence of resistance on pressure*

Three specimens were studied in these experiments. *K* (1) was used only for a study of the effect of pressure on residual resistance; the pressure effect was studied over a wide temperature range on specimen *K* (2) and checked at several temperatures on K (5). The results of these experiments are given in Table 4 and are illustrated in figure 2. It will be seen that our results for the initial pressure coefficient of resistivity agree well with the values obtained by Bridgman (1921, 1925).