This is in marked contrast to the behaviour of sodium and potassium. Although in sodium and potassium there are rather large variations of θ'_G with temperature below about $\frac{1}{4}\theta$, it is seen that above this temperature θ'_G does not vary much, at least when it is evaluated at constant density. In fact it turns out that in all the monovalent metals for which reliable data are available (the data on rubidium and caesium are rather doubtful) the temperature dependence of the ideal resistivity above about $\frac{1}{4}\theta$ can be represented by an equation of the form of equation (1) with the same function f for all of them. Moreover, the function approximates quite closely to the Bloch–Grüneisen function.

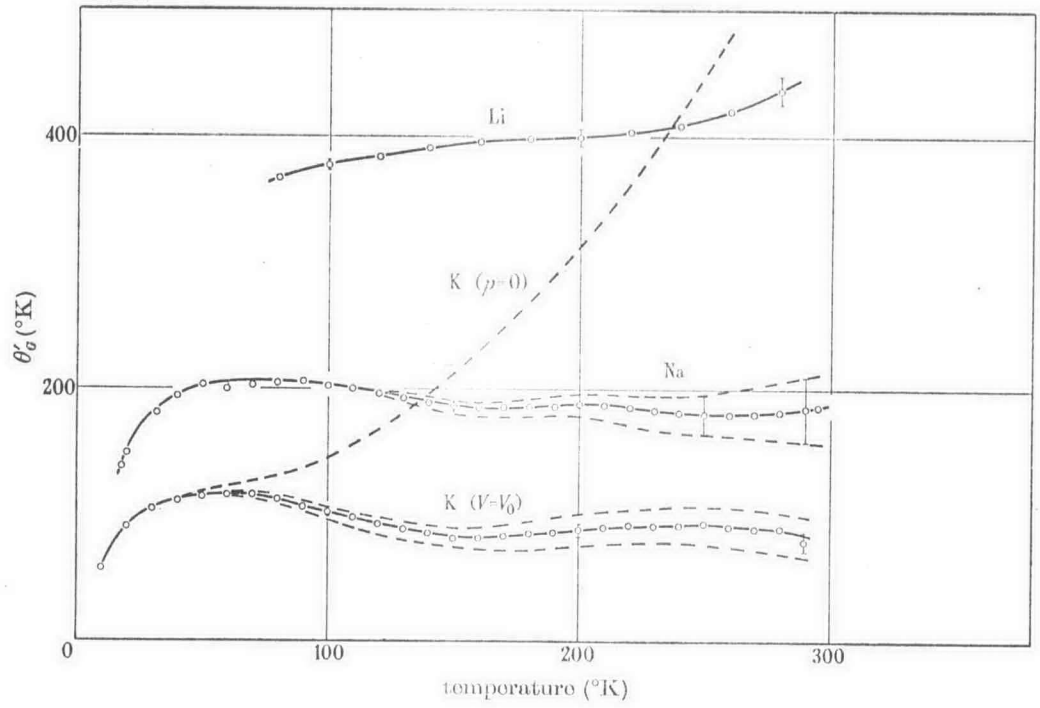

FIGURE 3. θ'_G for b.c.c. lithium, b.c.c. sodium and potassium. θ'_G was calculated by comparing the experimental temperature dependence of ρ_i at constant density with that predicted by the Bloch–Grüneisen formula. The bars indicate the approximate limits of random error, the dotted lines the approximate limits of systematic error which arise in the reduction of our experimental data to conditions of constant density. A curve of θ_G for potassium corresponding to the results for $p = 0$ is also illustrated.

The existence of this reduced equation shows that the temperature dependence of ρ_i in the monovalent metals is not sensitive to the details of the phonon spectrum or the electronic band structure of the metal except at very low temperatures (cf. MacDonald & Mendelssohn 1950). For example, both sodium and copper obey the Bloch–Grüneisen relation very closely over a wide temperature range although they have different crystal structures and quite different shapes of Fermi surface. As we shall discuss below, the existence of this reduced equation at temperatures above about $\frac{1}{4}\theta$ has important consequences for the dependence of the pressure coefficient of ρ_i on temperature.