We have also compared the Debye temperatures for different molar volumes as a function of the reduced temperature T/θ_D. This comparison is made in table 11 where values of $\theta_D(V)/\theta_D(V_0)$ are listed as functions of T/θ_D (we chose $V_0 = 12{\cdot}57$ cm^3/mole for ^{3}He and

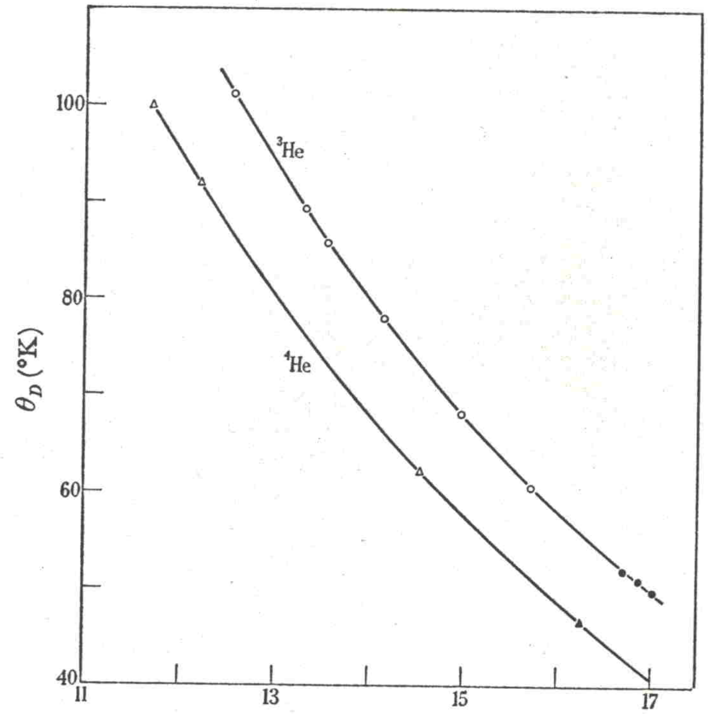

FIGURE 15. The Debye temperatures of solid ^{4}He and solid ^{3}He as a function of volume at the same reduced temperature ($\theta_D/T = 18$). The open points are directly measured values; the closed points are extrapolated from a slightly higher reduced temperature.

TABLE 11. $\theta_D(V)/\theta_D(V_0)$ AT DIFFERENT REDUCED TEMPERATURES FOR SOLID ^{3}He AND SOLID ^{4}He

(V_0 has been taken as 12·57 cm^3 mole for ^{3}He and 11·77 cm^3 mole for ^{4}He)

^{3}He

θ/T \ V (cm^3) =	13·33	13·56	14·16	14·98	15·72	16·71	16·87	17·02
18·0	0·881	0·846	0·769	0·672	0·597	—	—	—
15·2	0·874	0·844	0·767	0·671	0·601	0·514	0·504	0·490
12·9	0·875	0·841	0·761	0·668	0·596	0·513	0·503	0·491
11·0	0·872	0·837	0·761	0·667	0·594	0·509	0·499	0·488
9·7	0·874	0·840	0·758	0·664	0·590	0·501	0·493	0·480
8·25	0·874	0·839	0·756	0·656	—	—	—	—

^{4}He

θ/T \ V (cm^3) =	12·22	14·55	16·25
18·0	0·919	0·620	—
12·0	0·923	0·624	0·474
9·0	0·920	0·614	0·462

$V_0 = 11{\cdot}77$ cm^3/mole for ^{4}He). There is clearly a systematic change in this ratio as the melting point is approached. This might be due, for example, either to anharmonic effects in the lattice vibrations or to the formation of vacancies in the lattice. Apart from this