L_0 is the latent heat of vaporization at 0 °K, $p_m \Delta V_m$ is the work done in solidifying the liquid at 0 °K, and the two integrals give the work of compression in the liquid and the solid range, respectively. (V_1 is the volume of the liquid in equilibrium with its vapour, V_2 in equilibrium with the solid, and V_3 that of the solid in equilibrium with the liquid.)

TABLE 10

	p (Kg/cm²)	V (cm³/mole)	U_0 (cal/mole)
liquid 0 °K	0	36·63	−5·04
liquid 0 °K	29	26·0	−2·6
b.c.c. solid 0 °K	29	24·2	−1·8

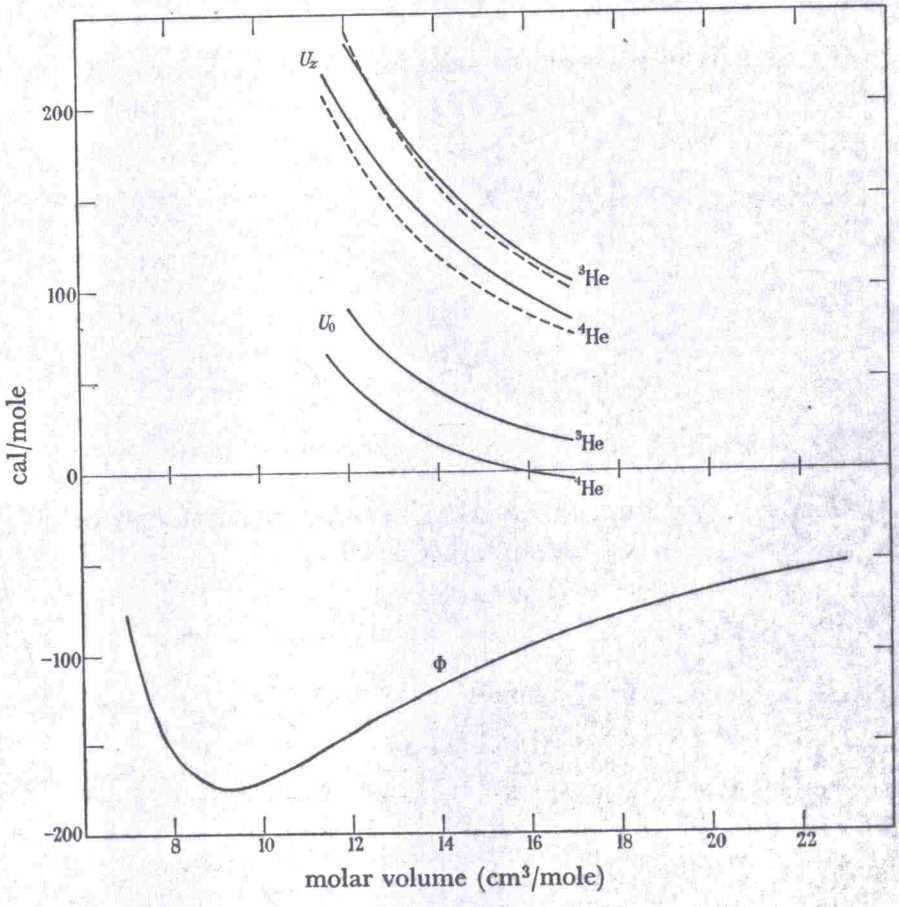

FIGURE 13. Energy relations at 0 °K for solid ^{4}He and ^{3}He. U_z is the zero-point energy; U_0 is the internal energy at absolute zero; and Φ is the classical static lattice energy calculated from the de Boer–Michels potential. ——, Experimental; ------, London (1954).

For ^{4}He we have taken Swenson's (1950) estimate for one value of U_0. According to this, U_0 for the solid at the melting pressure is −11·9 cal/mole. In order to obtain U_0 for smaller molar volumes we have to calculate the work of compression according to equation (11). This information is known from the present experiments between 17·0 and 11·5 cm³/mole. Up to $V = 17$ cm³/mole we have used an extrapolation of the isotherm at 0 °K. This extrapolation gives $U_0 = -5{\cdot}07$ cal/mole for $V = 17{\cdot}0$ cm³/mole.