figuration exists at different temperatures of measurement T_{m1}, T_{m2}, one expects

$$[(\mu_0-1)_{T_d,T_{m1}}(K^{\frac{1}{2}}/I_s)_{T_{m1}}]/[(\mu_0-1)_{T_d,T_{m2}}\cdot(K^{\frac{1}{2}}/I_s)_{T_{m2}}]=1.$$

Table I shows that this relation holds well if after demagnetization the change of temperature is such as to produce an excess of walls. The results are qualitatively summarized in the undermost part of Fig. 9.

The high degree of stability of an excess of walls might be due to some coupling of these walls during the demagnetization process by which they were formed. An additional experiment, in which no ac field was applied at the low temperature, points in this direction.

The specimens of Table I were demagnetized at 15° and, before being measured at 15°, cooled to −196°C. The (μ_0-1)-values obtained were 0.57 (specimen *A*) and 0.35 (specimen *B*). Comparison with (c) and (d) in Table I shows that an excess of walls is once more metastable. But not all walls formed at low temperatures are now retained.

TABLE I. Contribution of wall movement to (μ_0-1). T_m: temperature of measurement. T_d: temperature of demagnetization. Letters (a), (b), (c), and (d) as in the schematic representation of Fig. 9.

	T_m	$-196°$	15°C	$\left[\frac{(\mu_0-1)_{-196}}{(\mu_0-1)_{15}}\cdot\frac{(K^{\frac{1}{2}}/I_s)_{-196}}{(K^{\frac{1}{2}}/I_s)_{15}}\right]_{T_d=\text{const}}$
		(A) large crystals		
T_d	−196°C	1.31 (a)	1.12 (b)	0.96
	15°C	0.97 (c)	0.41 (d)	1.94
		(B) small crystals		
T_d	−196°C	1.25 (a)	1.09 (b)	0.94
	15°C	0.72 (c)	0.21 (d)	2.8

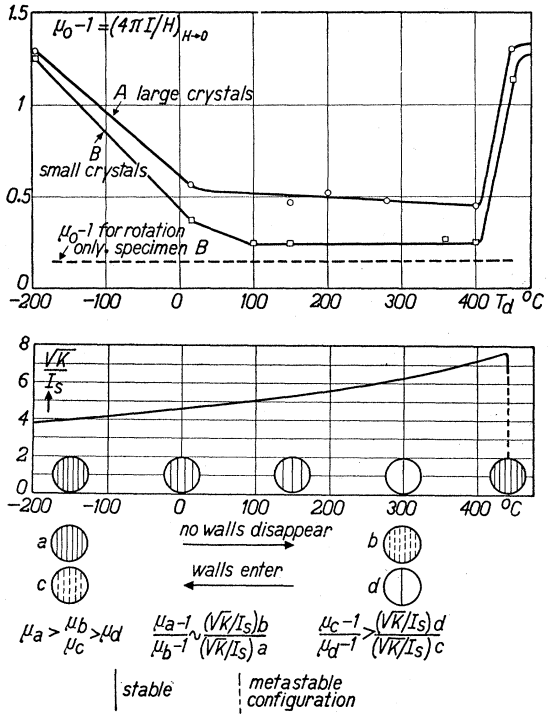

FIG. 9. Initial permeability μ_0 measured for $BaO\cdot 6Fe_2O_3$ with random crystal orientation at room temperature. Before the measurement the material was cooled down from above the Curie point in a field-free space, then demagnetized at the temperature T in an alternating-current field decreasing in amplitude from 4250 oersteds. It was then brought to 15°C and measured.
Curve A: large grains; curve B: small grains.

As is to be expected, demagnetization and measurement at −196°C, with an intermediate heating to 15°C, lead exactly to the values (a) of Table I.

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DISCUSSION

G. W. RATHENAU, *N. V. Philips Gloeilampen Fabrieken, The Netherlands* (in answer to questions): Near room temperature, magnetoelastic energy and shape energy are negligible compared with crystalline energy: λ (perpendicular to axis) $\cong 20\times10^{-6}$. The results are consistent with the idea that this is true also at higher and lower temperatures.

The texture can be made very perfect, as is shown by the curve for the low coercivity oriented sample.

Saturation of nonoriented material requires very high fields.

C. L. HOGAN, *Bell Telephone Laboratories, Murray Hill, New Jersey:* According to data recently taken at the Bell Telephone Laboratories, Ferroxdure at 9000 Mc induces a Faraday rotation of less than 0.1 degree/cm in a round wave guide, in applied magnetic fields up to 6000 oersteds. Compared with ferrites, it shows a very low loss at 9000 Mc, but high loss at 48 000 Mc.

M. T. WEISS, *Bell Telephone Laboratories, Murray Hill, New Jersey:* Have any ferromagnetic resonance experiments been made on these $BaO\cdot 6Fe_2O_3$ materials?

G. W. RATHENAU, *N. V. Philips Gloeilampen Fabrieken, The Netherlands:* Such experiments are being conducted, but no final results can yet be reported.