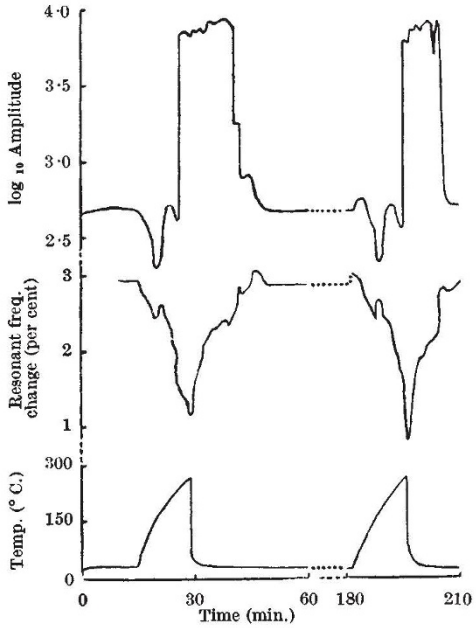

Fig. 1. Onset of metastable state with temperature rise (polarizing field 280 oersteds)

is proportional to the amplitude and also to the square of the dynamic magnetostriction constant, λ, as defined by the relation $\delta p = \lambda \delta H$, where δp is the incremental stress resulting from a small change δH in the applied magnetic field.

Magnetic polarization of the specimen was effected by passing a direct current (maximum value 7 amp.) through additional coaxial coils, the maximum polarizing field being 280 oersteds. At the higher currents used, considerable heat was developed in the polarizing coils, causing a rise in temperature of the stack. The surface temperature was measured by a contact thermocouple.

Typical curves are shown showing the variations with time in the amplitude of motion as the temperature varied, for the case of a laminated bar made from pure *cold-rolled* nickel sheet 0·005 in. thick. It will be seen that following a rapid rise of temperature (brought about by shutting off the forced-air cooling

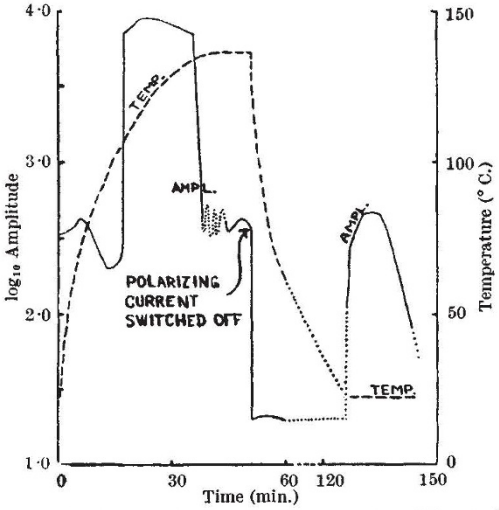

Fig. 2. Recurrence of metastable state after nickel has cooled (polarizing field 200 oersteds)

system), there is a large increase in λ, which it is possible to maintain for a period of hours or even days. This effect was not obtained with similar experiments made on a number of nickel alloys.

It may be found that these metastable conditions can be employed for a highly efficient magnetostrictive transducer, which could be used in special circumstances where the higher temperatures do not present any difficulties.

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Decay of Thulium-170 and Rhenium-186

THE decay of the 127-day thulium isotope (Tm^{170}) has been previously investigated by Bothe[1], and that of the 93-hour rhenium isotope (Re^{186}) by Goodman and Pool[2]. In both cases absorption methods were used.

The present investigations were carried out by means of absorption and coincidence techniques, and also by means of a short magnetic-lens β-ray spectrometer.

A summary of our results appears below:

	β-rays	γ-rays
Tm^{170}	1·00 ± 0·01 MeV. 0·90 ± 0·015 0·79 ± 0·03 0·45 ± 0·05	82·6 ± 0·7 keV. 200 ± 10 440 ± 20
Re^{186}	1·095 ± 0·010 MeV. 0·945 ± 0·015 0·64 ± 0·030	132 ± 1 keV. 275 ± 5

A more detailed account of this work will appear shortly.

We wish to express our appreciation of the help given by members of the Atomic Energy Research Establishment, Harwell, where the active samples were prepared by slow neutron irradiation in the low-energy pile.

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[2] Goodman, L. J., and Pool, M. L., *Phys. Rev.*, **71**, 288 (1947).

Dielectric Absorption in Crystalline Long-Chain Ketones

FOR dilute solid solutions of long-chain polar compounds in paraffins, it has been shown that the rotational transitions of the polar molecules from one position of minimum potential energy to another lead to dielectric absorption of the Debye type[1,2]. A theoretical study has also been made[3,4] of the dielectric properties of pure crystalline compounds, in which dipolar interaction is an important factor.