detonation wave will be discussed fully in a paper to be published shortly.

I acknowledge my thanks to the Chief Scientist, Ministry of Supply, for permission to publish this letter.

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April 17.

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Anomalous Magneto-Resistance Effects in Bismuth

THE change of electrical resistance of bismuth in magnetic fields has been extensively studied, and the investigations of Kapitza[1] and subsequent workers on single crystals have led to the conclusion that the increase in resistance is proportional to the square of the field-strength in weak fields, becoming linear in strong fields. In the course of an investigation into the behaviour of thin fibres of bismuth, we have obtained results which indicate that in certain circumstances the resistance may undergo a small decrease at low field-strengths.

Fibres of bismuth in an envelope of soda glass may be prepared by hot-drawing and a wide variation in diameter is readily obtainable. The range in our experiments was about 5–150 μ. For various orientations of the magnetic field the resistance has been measured as a function of the angular displacement of the specimen. With the axis of rotation parallel to the specimen and perpendicular to the field, the resistance 'cycles' have a periodicity of π. A typical example is shown in Fig. 1.

Comparison of such results with those obtained for single crystals[2] leads to the conclusion that, in general, the fibres are single crystals with the main cleavage plane parallel to the axis.

For a given orientation, the resistance may be plotted against field-strength. In the case of certain fibres the curve so obtained is anomalous in that the change of resistance is negative for a certain range of field strength. The effect is illustrated in Fig. 2, which was obtained with a fibre orientation corresponding to the minimum of Fig. 1.

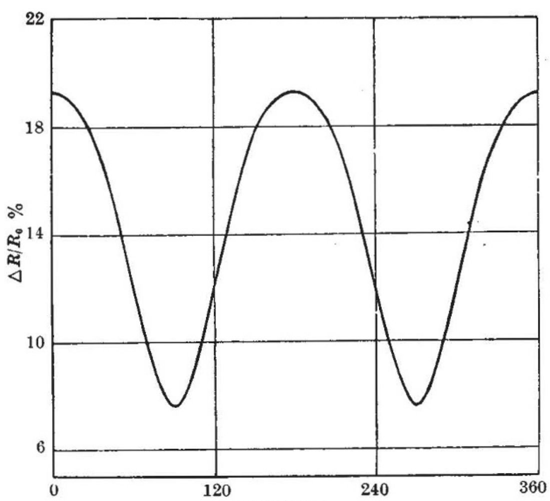

Fig. 1. Variation of resistance with orientation of field for a field of 6,300 oersteds (R_0 = 42 ohms)

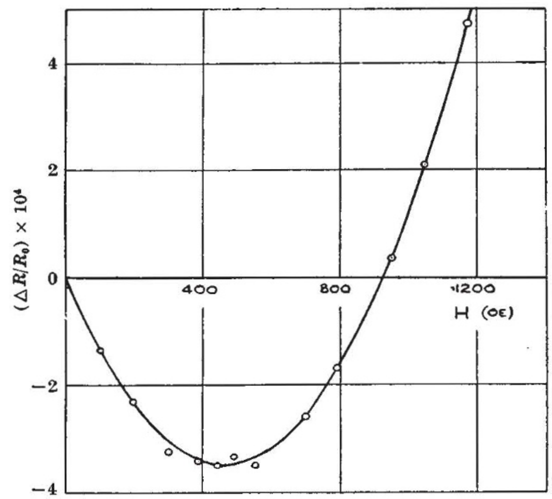

Fig. 2. Dependence of resistance on field-strength, illustrating the negative change

The anomalous change is quite small, and it will be seen that at the minimum of Fig. 2 it is of the order of 4 parts in 10^4. At first sight, a possible interpretation would appear to be in terms of a Hall E.M.F.; but the form of the specimens makes this unlikely and, moreover, the phenomenon does not appear with all fibres.

A negative change in resistance has been predicted on theoretical grounds by Meixner[3] for certain relative orientations of current, field and crystal axis. No previous experimental evidence is known to us, with the possible exception of a paper by Casimir and Gerritsen[4]. The latter, however, attribute their apparent *Umkehreffekt*, obtained with a single crystal, to the presence of a Hall E.M.F. In the case of our specimens, it would seem that while the direction of the current is normally parallel to the main cleavage plane, cases sometimes occur in which this is no longer the case.

A more detailed discussion will be presented elsewhere.

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April 20.

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Excited States of Silver Bromide and Iodide

IT appears that study of the absorption spectra of the silver halide vapours has, with the exception[1] of silver chloride, hitherto been confined to wavelengths above about 2500 A. We have recently photographed the absorption spectra of silver bromide and iodide in the range 2150–3000 A. with a Hilger medium quartz instrument. Within rather critical pressure limits, red-degraded absorption bands are observed in the region 2150–2475 A. for silver bromide and 2150–2350 A. for silver iodide.

For silver bromide, some forty bands have been assigned to a single system involving a transition between the ground-state[2] and an excited state with