$-67 \cdot 2 \times 10^{-6}$, for the mean susceptibility, we get $\chi_a = -66 \cdot 2 \times 10^{-6}$, $\chi_b = -74 \cdot 3 \times 10^{-6}$, $\chi_c = -61 \cdot 0 \times 10^{-6}$, and $\alpha = 55 \cdot 9°$, $\beta = 47 \cdot 0°$, $\gamma = 62 \cdot 1°$, in satisfactory agreement with the results of K. Lonsdale.

I have also made a preliminary investigation of the magnetic anisotropy of ammonium nitrate at different temperatures up to the melting point of the crystal. The magnecrystallic data seem to lend support to the findings of X-ray analysis[5] in regard to the variation of the crystalline structure of ammonium nitrate with temperature.

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The X-Ray Microscope

As I pointed out some time ago[1], a new kind of X-ray spectra can be obtained by focusing the characteristic X-radiation emerging from the surface layer of an object. Instead of the usual spectral lines, these spectra contain a series of monochromatic *spectral images*, each of them showing the distribution of a certain chemical element in the surface layer of the object. Fig. 1 shows a new arrangement of the object, crystal and photographic plate giving a more distinct and even enlarged monochromatic X-ray image. The object O is excited to secondary radiation by primary X-rays. The secondary radiation is reflected on the concave side of the cylindrical crystal K and collected to the true monochromatic X-ray image I. If the dimensions of the object are small compared with the radius R of the crystal, it is possible to satisfy the conditions for a *true enlarged image* by adjusting the positions and inclinations of object and photographic plate.

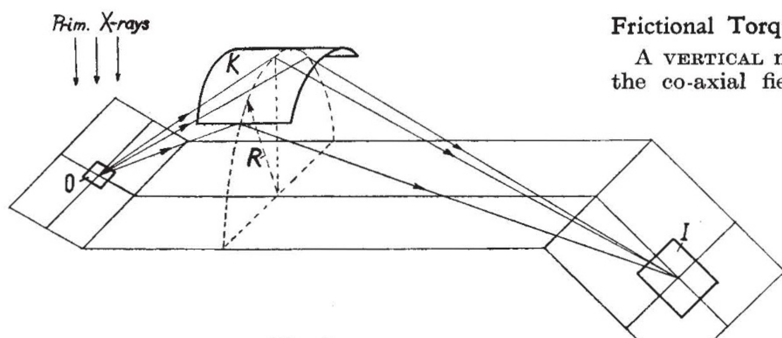

Fig. 1

The test-object for the method was a packet of thin metal foil polished perpendicular to the planes of the different layers. Fig. 2 shows the X-ray photomicrograph of such a test-object (above), with the dimensions of the different layers (below). The X-ray photo-micrograph corresponds to the iron K-α-radiation, and as this radiation consists of two slightly different wave-lengths, the image of the iron foil appears twice.

By such X-ray photomicrographs chemical analysis for a great number of chemical elements in objects not larger than 10^{-8} c.c. is made possible without dissipating the sample.

A more detailed theory of this X-ray microscope will be published in the *Journal of Scientific Instruments*.

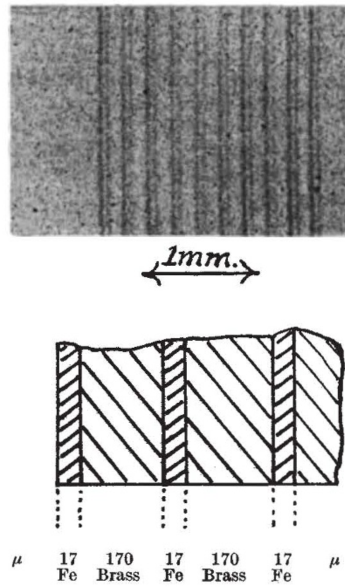

Fig. 2

I wish to acknowledge my grateful thanks to Prof. G. Aminoff for giving me the opportunity to carry out this investigation at the Mineralogical Department of the Riksmuseum, Stockholm, and to Prof. W. L. Bragg for suggestions concerning the publication of this paper.

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Frictional Torque of an Axial Magnetic Suspension

A VERTICAL needle of iron suspended *in vacuo* by the co-axial field of a solenoid theoretically may have infinitesimal frictional torque against axial rotation. The purpose of the present note is to report an observed value of this frictional torque.

The arrangement used is a modification of that previously reported by one of us[1]. A solenoid carrying a steady direct current produces a magnetic field sufficiently strong to support a large fraction of the weight of the needle. A vane mounted on the needle controls the amount of light striking a photo-cell. The current from this cell is amplified and fed to a second lifting solenoid. Thus the needle is automatically maintained at a pre-determined height. Vertical oscillations about this position were damped out by using a large resistance in, and capacitance across, the power supply for the amplifier output tube[2].

For this experiment the vane was a solid aluminum