done in mica simply by heating it to red heat and then cooling; but not so well by carefully crushing plates of other crystals. When a thin beam of X-rays passes through such a plate, the effect of two-dimensional lattices will be added, whereas the space effect will be destroyed by the incoherence of waves produced by scattering from incorrectly spaced layers.

On the photograph (Fig. 1) obtained by this method with Cu-radiation from mica, is seen a system of spectra corresponding to a series of two-dimensional lattices making different angles with each other.

From the measurement of these spectra the distribution of molecules in the layers of mica may be determined. All the spectra obtained may be explained by assuming that the molecules are distributed in the summits of equilateral triangles the sides of which are equal to 5·2 A.

The phenomenon is quite analogous to the diffraction of cathode rays from mica obtained by Kikuchi (*Japanese Journal of Physics*, vol. v. No. 2).

Somewhat more diffused photographs by the same method are obtained from gypsum and Iceland spar.

A photograph taken of a crystal before cleavage gives the usual Laue figure.

Owing to the facility of interpretation of the spectra of a two-dimensional lattice, this method may be of service in the study of crystal structure.

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High Frequency Discharge in Gases.

FOR some time past we have been studying the problem of high frequency discharge through air and other gases. In the course of our investigation we found that whether the electrodes are of external metal sleeves or are of internally sealed aluminium wires, steady striations always appear in the tube under suitable experimental conditions. Recently Heidemann (*Ann. d. Physik*, **85**, Nr. 6; 1928) and Dr. S. P. McCallum and Mr. W. T. Perry (NATURE, Jan. 12, 1929) have observed striated discharges in hydrogen and argon with external electrodes. The general nature of the striated discharges appears to be the same in all gases. Over and above what they have noted we have been able to observe certain new characteristic features of the discharges.

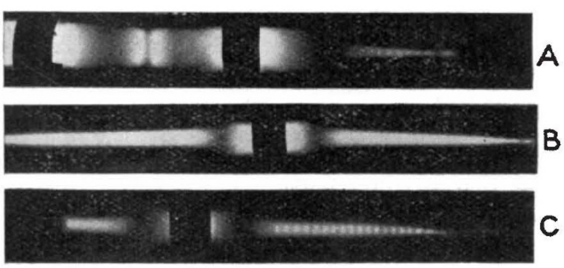

FIG. 1.

(1) There is a striking difference in the nature of striations with internal and external electrodes. Whereas with external electrodes the striations are generally of the nature of 'double-layers' (Heidemann and McCallum and Perry), with the internal electrodes they have always a comb-like appearance excepting at very low pressures.

(2) As the pressure is lowered the thickness of the striæ increases. At a still lower pressure the glow extends *beyond* the electrodes and striations can be observed in this region also (Fig. 1A).

(3) The same glow discharge can be obtained with only one external electrode. In this case the discharge is always of the form of two convergent beams with their apexes away from the electrode (Fig. 1B). The beams after converging, however, again begin to diverge from the apexes. It will be noticed that there are two very prominent dark spaces in the region beyond the electrode. Beginning from this the discharge generally passes into a uniform glow. But, with suitable pressure and power regulation the glow can be made to break up into striations (Fig. 1C). It will be seen from the photographs that these striations become more prominent as the distance from the electrode increases.

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Magnetic Behaviour of Organic Crystals.

THE interesting observations of Sir William Bragg on the deportment of crystals of naphthalene in a magnetic field (NATURE, Supplement, May 7, 1927) have been followed up quantitatively in this laboratory, and some very significant results have been obtained. It is found that the diamagnetic anisotropy of naphthalene is extremely pronounced, the susceptibilities along the three magnetic axes of the crystal being approximately in the ratios 16 : 7 : 4. That such a high degree of anisotropy is to be expected in aromatic compounds is indicated by the data for magnetic birefringence in liquids, as had indeed been shown earlier (C. V. Raman and K. S. Krishnan, *Proc. Roy. Soc.*, A, vol. 113, p. 511; 1927). Mr. S. Bhagavantam, who made the measurements, finds that the axes of maximum diamagnetic susceptibility and of minimum optical dielectric constant in naphthalene crystals are approximately coincident. This observation explains why organic liquids derived from naphthalene, and indeed also aromatic liquids generally, exhibit a strong *positive* magnetic birefringence. We may further expect to find that in aromatic compounds generally, the magnetic and optical characters are linked together more or less in the same way as in naphthalene crystals.

The magnetic behaviour of organic crystals of the aliphatic group of compounds is different. Not only is the anisotropy, in general, less pronounced, but also the relation between the magnetic and optical characters is more varied. In some crystals, for example, iodoform, Mr. Bhagavantam finds the axes of maximum magnetic susceptibility and optical dielectric constant are parallel; while in others, for example, urea, they are crossed. These facts have a bearing on the explanation of the fact that liquids of the aliphatic class exhibit a magnetic birefringence which is usually much feebler than in aromatic liquids, and further that in some of them the magnetic birefringence is positive and in others negative. An extended series of measurements of magnetic birefringence in liquids of the aliphatic class is now being made by Mr. Ramanadham here, and is serving to elucidate the relationships between the optical and magnetic characters of organic compounds and their dependence on chemical constitution.

Since the position of the magnetic axes of a crystal depends on the orientation of the molecules in the unit cell of the lattice, it is clear that the studies of magnetic behaviour of organic compounds will form a powerful auxiliary to X-rays in the analysis of their crystal structure.

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