

the sign of the potential due to this field which fits the magnetic data, that the field should correspond to an octahedral distribution of six equal negative charges around the Cu^{++} ion. This result is not obvious from general structural considerations, since the crystal is triclinic, and there are five molecules of water and one SO_4 group associated with each Cu^{++} ion. The result, however, has been beautifully verified by the X-ray studies of Beevers and Lipson² on the structure of the crystal. The Cu^{++} ion is found to be at the centre of an octahedron of six negatively charged oxygen atoms. Four of them belong to four water molecules, and they form a square with the Cu^{++} ion in the centre. The other two, which are contributed by two sulphate groups, are located centrally above and below this square.

Now this octahedron is only approximately regular, the oxygens of the water molecules being closer to the Cu^{++} ion than the other two. The crystal field acting on the Cu^{++} ion should therefore deviate considerably from cubic symmetry, and its intensity along the normal to the plane of the water molecules should be less than for directions in the plane. Now there are two such Cu^{++} ions in the unit cell of the crystal, and the two corresponding squares of water molecules make with each other an angle of 82° , which is nearly a right angle. One would therefore expect: (1) that the crystal should be magnetically anisotropic, which is a trivial result since the crystal is triclinic; (2) that two of the principal suscepti-

bilities of the crystal should be nearly equal, and greater than the third (that is, the magnetic ellipsoid should be approximately an oblate spheroid); (3) that the axis of this spheroid should lie along the line of intersection of the planes of the two squares of water molecules in the unit cell. All these conclusions have been verified experimentally³.

The directions of the two nearly equal axes of the ellipsoid can also be predicted from the fine structure of the crystal: the shorter of them should lie in the plane bisecting internally the two squares of water molecules. Since the angle between the two squares differs by only 8° from a right angle, this last conclusion cannot be accepted with the same confidence as the others. From a study of the magnetic anisotropy for a number of planes in the crystal, we have recently determined the directions of these two magnetic axes, and they too lie nearly as predicted from the structure.

Thus the magnetic data confirm in a striking manner the structure proposed by Beevers and Lipson for the crystal.

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¹ *Phys. Rev.*, **45**, 87 (1934).

² *Proc. Roy. Soc., A*, **146**, 570 (1934).

³ Krishnan and Mookherji, *Phys. Rev.*, **50**, 860 (1936).

Points from Foregoing Letters

Prof. A. C. Cuthbertson, Geoffrey Gee and Prof. E. K. Rideal find that pure vinyl acetate does not polymerize measurably at 100°C . even in the presence of oxygen. A peroxide derived from acetaldehyde, however, catalyses the reaction. The authors suggest that the discrepancy in the findings of various observers between the rate of polymerization of gaseous and liquid styrene may be likewise explained by the presence of a peroxide catalyst in the liquid phase.

J. S. Kennedy describes how solitary locusts belonging to the species *Schistocerca gregaria* on the Red Sea coast, crowd together into patches of dense but uneven vegetation, and this fortuitous concentration brings about the change from the solitary to the gregarious 'phase'.

A photomicrograph of a horizontal section of skin from a four months' old Merino lamb is submitted by Dr. A. B. Wildman in support of the late Prof. J. E. Duerden's view that the 'trio' follicles which at first produce the coarse birth-coat fibres may later produce a fine non-medullated wool fibre.

The appearance of male sex organs in female guinea pigs after the almost complete removal of the ovaries is described by Prof. A. Lipschütz. This, the author points out, does not exclude the possibility that male hormones are produced in the ovary.

Taking the elimination of Congo-Red dye from the body as a measure of the activity of the reticulo-endothelial system, C. Wetzler-Ligeti and Dr. B. P. Wiesner find that certain aqueous pituitary extracts stimulate the activity while other extracts of the anterior lobe of the pituitary having thyrotropic activity and containing a proportion of sex hormones lower the activity.

Following upon theoretical considerations of entropy increase, Dr. C. Zener calculates the frequency of transverse vibrations for which the internal friction is a maximum, in the case of wires of various materials (glass, steel, silver, etc.) from the known values of their Young moduli; he submits a table showing that the values obtained agree with those experimentally determined by Bennewitz and Rötger.

From measurements of the density distribution of neutrons around a source, in different hydrogenous liquids, Drs. O. R. Frisch, H. von Halban, jun., and Jørgen Koch have obtained values for the capture cross-sections of hydrogen and nitrogen, for neutrons of thermal energy; in the cases of deuterium, carbon and oxygen, upper limits for the capture cross-sections have been established. Furthermore, the cross-sections of deuterium and beryllium for photo-dissociation by the gamma rays of radium have been determined.

Whilst certain *o*-substituted acetanilides give indication of chelate ring-formation between the two neighbouring groups, Dr. L. Hunter and H. O. Chaplin find that substitution of a group in the second *ortho* position prevents chelation. This fact is interpreted as evidence of restricted rotation about the nitrogen-nuclear single bond in 2:6-disubstituted acetanilides.

From a consideration of the fine structure of the $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ crystal (triclinic) analysed by Beevers and Lipson, Prof. K. S. Krishnan and A. Mookherji locate the directions of the maximum and the minimum susceptibilities of the crystal, and further state that the intermediate principal susceptibility should be almost equal to the maximum. These results have been verified experimentally.