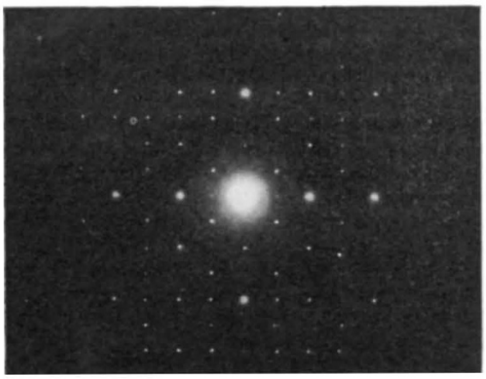
immediately takes place, giving films of the reaction products adhering to the gauze and highly suitable for transmission electron diffraction experiments. The upper pattern is from a potassium bicarbonate ($KHCO_3$) single crystal produced by the method



described, the reaction being allowed to take place between potassium and water in the presence of air; the lower pattern is from a calcium chloride ($CaCl_2{\cdot}2H_2O$) single crystal similarly obtained but utilizing the reaction between calcium and 12 *N* hydrochloric acid.

The potassium bicarbonate crystal has already been studied by X-rays and the data serve well for comparison here. The dimensions of the reciprocal lattice determined by the *N* pattern here obtained are: $a^* = 15{\cdot}4$ A. and $b^* = 5{\cdot}72$ A.; X-ray work gives $a = 15{\cdot}01$ A., $b = 5{\cdot}69$ A., and $\beta = 104° \ 30'$ (monoclinic structure). The new method of preparing films thus gives results in good agreement with X-ray findings.

As is well known, structure determination from t h *N* pattern is more definite than that by X-rays, h e ce the present work is in this respect also of significance. Due to the highly hygroscopic nature of $CaCl_2{\cdot}2H_2O$, the determination of its structure has been beyond the scope of X-ray technique. I am working on its structure as given by the *N* pattern here obtained.

This work has been conducted under the direction of Dr. Ichirô Iitaka.

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Magnetization of Matter by Light

ONE of us (F. E.) has shown that small particles of matter of different chemical elements, but of the same physical qualities, irradiated by concentrated light, move in a homogeneous magnetic field, some of them toward the north, some toward the south pole (magnetrode). Therefore, there must be a preponderance of either north or south magnetism on each of those irradiated particles, and they behave like single magnetic poles (charges)[1]. Further, experiment led to the conclusion[2] that, in addition to the oscillating electric and magnetic vectors, light beams must have electric stationary components in the direction of the wave front normal, and that consequently there must be stationary electric potential differences between different points along the beam; and that there must be also a stationary magnetic field in the beam of light with potential differences. Hence, the light beam must have a magnetizing effect, and the charge of a magnet should be changed by light.

Examination of the literature by the other of us (L. B.) showed that even before the time of Oerstedt's experiments, Domenico Morichini[3] (1812) magnetized compass needles by means of the ultra-violet portion of the spectrum of sunlight as used by Herschel. His experiments were verified by M. Sommerville[4], F. Zantedeschi[5], V. Baumgartner[6] and others.

We therefore undertook to test the photomagnetic effect also on larger bodies in continuation of the above-mentioned fundamental experiments on submicroscopic bodies (magneto-photophoresis), through which the general magnetization of the elements and the existence of magnetic 'currents' was brought to light. The experiments were successful with the simplest apparatus, undertaken in a private apartment with a 10 cent compass needle from Woolworths as indicator, and using a beam of light rich in ultraviolet radiation (Hanovia mercury arc, Mazda G.E. daylight bulb) which was concentrated by means of quartz lenses (Hanovia, Zeiss).

Magnetic poles (charges) were induced in various non-magnetic and annealed pieces of iron (paperclips, nails, little iron rods), which were placed perpendicularly to the geomagnetic field, by irradiation for periods varying from minutes to several hours. Those poles were mainly north magnetic and were still present in many specimens after several days.

After short periods of irradiation, it could be shown that the effect was local and on the surface. After long irradiation periods saturation values were obtained.

We also convinced ourselves by means of an amplifier and oscillograph of the Amplifier Company of America that the characteristic of an induction coil with an iron core changed under ultra-violet irradiation.

Naturally, the magnetization was also dependent upon the material, its surface and history to a very high degree. Further investigations are in process.

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