lute' measurements of the intensities of the reflections from a number of anthracene planes. These measurements were expressed as ratios between the structure factors actually found, and the structure factor to be expected if all the atoms were in the reflecting planes. It was intended that these results and deductions therefrom should be incorporated with my paper, the publication of which was to be delayed for the purpose: unfortunately, owing to my absence from England, there was some confusion during the revision of the proofs and this was not done. Sir William Bragg's figures lead to a structure resembling Dr. Banerjee's so closely that it is interesting to give the following quotation from a letter which he wrote to me. It is in the form of notes upon a table of structure factors:

No. 1: "A flat molecule, axis along the *c* axis; plane of molecule making an angle of 25° with the *bc* plane. This gives good values in the *c* zone, but not in the *b* zone; especially the 201 is far too weak. So next (No. 2) the molecule is tipped over a little more to the upright position (about 6°). This greatly improves the *b* zone. . . . In No. 3 a slight buckle is put in, to try to improve the notable 204. The consequences are not very striking. On the whole there is so much agreement that we cannot be very far wrong."

Plane.	*S* Observed.	*S* Calculated.		
		No. 1.	No. 2.	No. 3.
200	0·70	0·68	0·58	0·50
020	0·33	0·32	0·32	0·31
110	0·50	0·47	0·48	0·47
210	0·67	0·58	0·52	0·55
310	0·20	0·23	0·19	0·17
410	0·55	0 67	0·39	0·29
320	0·50	0·55	0·40	0·42
001	0·22	. .	. .	0·23
002	0·26	. .	0·19	0·15
$20\bar{1}$	0·50	0·14	0·43	0·40
204	0·80	0·27	0·50	0·73

Whether the carbon atoms in these molecules lie in one plane as strictly as do the graphite carbon atoms, or those of hexamethylbenzene, can scarcely yet be stated with certainty. But the structure certainly appears to approximate to those types.

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Physics Dept., Michigan University,
Ann Arbor, U.S.A., Jan. 6.

The Crystal Structure of Xenon.

Of the rare gases, argon is the only one of which the crystal structure is known (F. Simon and V. Simson, *Zeit. f. Phys.*, **25**, 160; 1924). We have now been able to determine the crystal structure of xenon by a method allowing the use of a very small quantity of gas: it was condensed as a very thin layer upon the surface of a quartz capillary internally cooled by liquid air. The thickness of the condensed layer can be estimated to be about 0·004 cm.

We obtained very good photograms by the powder method, using a Philips tube fitted with iron anticathode in less than 2½ hours exposure. From the photograms, consisting of sixteen lines, three of which correspond to the Kβ radiation of iron, we have been able to establish that xenon, like argon, shows a face-centred cubic structure.

The lattice constant of the elementary cell, consisting of four atoms, is $a = 6{\cdot}18 \pm 0{\cdot}01$ A.: the volume is $236{\cdot}03 \times 10^{-24}$ c.c. and the calculated density, taking as the weight of the hydrogen atom $1{\cdot}65 \times 10^{-24}$ gm., is $d = 3{\cdot}64$ gm./c.c. (The density of liquid xenon at the boiling-point is 3·06 (Ramsay and Travers).) From the previous data the atomic radius of xenon can be calculated as 2·18 A. The atomic radius calculated from gaseous viscosity measurements (A. G. Nasini and C. Rossi, *Gazzetta*, **58**, 433; 1928) is 1·70 A., thus being smaller than the crystal structure datum: we may point out, however, that the two figures bear the same ratio as for argon. The radius calculated from the present measurements is very similar to those, calculated by Goldschmidt, of the positive ions monovalent iodine, divalent tellurium, and tetravalent tin, having the same number of external electrons (Geoch. Verteilungsgesetz d. Elem., *Norske Vidensk. Akad.*, Oslo, **7**, 54; 1926).

We are now examining the crystal structure of krypton, but a modification of the present apparatus will be necessary, since the vapour pressure of krypton, at the temperature reached as above, is somewhat too high. A more detailed account of the present research and of the work on krypton will appear elsewhere.

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Behaviour of Electrons in a Gas Tube.

The late Mr. Campbell Swinton observed (*Proc. Roy. Soc.*, **61**, 79; 1897) that a carbon anticathode in a gas X-ray tube under certain conditions showed a ring of fluorescence which he considered due to the hollow nature of the cathode stream. The following preliminary account of some experiments with a gas X-ray tube of the Shearer type shows that the effect can be more complex than is usually suspected.

The anticathode end of a Shearer tube was replaced by a brass tube of approximately the same length and

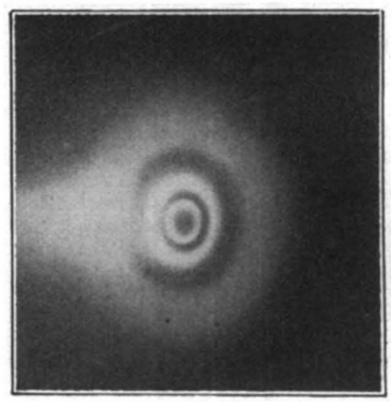

Fig. 1.

diameter. The tube was waxed in the usual way to the glass cylinder of the X-ray tube and was sealed at the other end by a glass plate so that the luminescence due to the electron stream from the cathode could be viewed end on.

It is found that the glass fluoresces in a very striking manner. At a pressure just greater than that at which the tube would normally be worked when producing X-rays, two bright concentric rings appear. The outer one is rather diffuse, the inner is remarkably sharp. As the pressure is decreased the inner ring subdivides into others equally well defined, and later, a bright point of fluorescence appears at the centre of the rings accompanied by intense local heating of the glass and the production of X-rays. The tension applied to the tube was of the order of 10,000 volts, and the effect observed was the same whether the