

and the plasma. As an example the following two cases may be considered, in which the figures given denote milligrams of phosphorus per 100 c.c.

	Whole blood	Red cells	Plasma	P in cells P in plasma
Case I (before irradiation)	25.5	53.0	6.0	8.8
(after " " )	38.75	69.0	14.5	4.8
Case II (before " " )	22.5	49.0	4.5	11.0
(after " " )	20.0	54.0	8.75	6.8

These figures were obtained for blood taken from the patients when fasting. The results of the phosphorus partition in the blood elements of a large number of patients will be published in a later communication. It seems to us that a periodic examination of the blood along these lines during a course of treatment may be a valuable guide to the changes in the condition of the patient.

This work has been done under the auspices of the Cancer Research Committee of the University of Sydney.

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#### Formation of Carbon Dendrites

THE formation of long carbon dendrites in the electrolytic reduction of aqueous colloidal dispersions of graphitic acid was recently reported by Luke, Madgin and Riley<sup>1</sup>.

If instead of the slightly viscous solution, a micellar

solution of high viscosity<sup>2</sup> is employed, this phenomenon is also shown clearly, as the movement of the colloidal particles away from the cathode towards the anode is hindered. In the near future a detailed description of other experimental results will be published.

It has been found possible to transform a colloidal solution of graphitic acid into a transparent gel which contains much water and is very similar to the gel of gelatine. The movement of the lamellæ of graphitic acid under an electrical potential is still further hindered in the gel. On touching a small piece of the gel with two platinum electrodes at a potential difference of 220 volts, carbon is formed by reduction at the cathode before the relatively large lamellæ have time to move away. The orientation of the disordered lamellæ under the influence of an electrical field observed under the microscope in polarized light<sup>3</sup> is confirmed by Messrs. Luke, Madgin and Riley<sup>1</sup>.

The electrochemical reduction of graphitic acid makes possible the following experiment. A thin film of graphitic acid<sup>4</sup> moistened with a few drops of water can be transformed into a thin film of graphite. It is possible to write on a film of graphitic acid, which may be formed on a piece of paper, using a platinum electrode.

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<sup>1</sup> NATURE, **138**, 161 (1936).

<sup>2</sup> Z. anorg. Chem., **190**, 145 (1930).

<sup>3</sup> Koll. Z., **56**, 129 (1931).

<sup>4</sup> Forsch. u. Fortsch., **10**, 408 (1934).

#### Points from Foregoing Letters

A RAPID numerical method for the calculation of structure factors and the summation of Fourier series in crystal analysis, which is also applicable to non-centro-symmetrical structures, is described by Dr. J. Monteath Robertson.

The interaction between two heavy nuclear particles is computed by Dr. D. Iwanenko and A. Sokolow on Fermi's theory, assuming the interaction transfer, not by one alone, but by an arbitrary number of pairs of electrons and neutrinos. The generalization of the previous law obtained gives the finite self-energy of a proton or neutron, just as Born's non-linear theory leads to finite self-energy of a point charge, which was impossible on the usual Coulomb formula.

The formation of coloured rings when silver or copper is 'cathodically sputtered' upon a glass plate, on which a drop of oleic acid has been placed, is described by U. K. Bose. The author explains the phenomenon by assuming that the condensed metallic sputtered particles form a surface film of the 'liquid expanded' or 'gaseous' type.

Surfaces of copper crystallized from a molten state by cooling *in vacuo* have been investigated by S. Dobinski and Dr. C. F. Elam both by means of X-rays and by the electron diffraction method. X-rays showed that the orientation of the crystals differed from specimen to specimen, while the electron method showed spots from copper crystals preferentially arranged. The authors suggest that this arrangement may be due to the planes of highest atomic density,

(111) and (100), arranging themselves parallel with the surface.

Diagrams illustrating a new arrangement of electrodes in a vacuum tube, by means of which electron oscillations of higher intensity than those obtained with the split-anode magnetron can be produced, are submitted by Prof. K. Okabe. A useful output of a few watts was obtained with an input of about twenty watts. The wave-length was eighty centimetres, but may be varied within a comparatively wide range.

Further evidence in support of the view that natural selection rather than environmental conditions determines mimicry in insects is adduced by Prof. G. D. Hale Carpenter.

Experiments with several constituents involved in the mechanism of respiration of cells, carried out by H. Theorell, show that cytochrome *c* (a pigment found in muscle tissue, etc.) is unable to oxidize the di-hydro-co-ferment directly, but does oxidize the leuco-form of the 'yellow pigment'.

The ratio of the phosphorus content of red cells and the plasma of the blood is found by Dr. H. L. Brose and E. B. Jones to be changed after treatment with X-rays or radium. The authors give two examples and suggest that the change may possibly serve as a measure of the effect produced upon the patient by a given dose of X-rays or radium.

Further experiments illustrating the reduction of graphitic acid at a cathode and the formation of carbon dendrites are described by Dr. H. Thiele.