Colloids and the Biological Effect of Radiation

SOME eight years ago there came to my notice a phenomenon which I now think must have been of the same type as that described in the letter from Dr. F. Ellinger, published in NATURE of December 12, p. 1014.

It was desired to demonstrate by means of a projection microscope the Brownian movement in certain colloidal solutions. Messrs. Zeiss kindly placed at our disposal a projection microscope in which the demonstration substance was subjected to very powerful illumination. It was found that when a colloidal calcium oleate protected by gelatine was placed in the cell, the particles, which showed very active Brownian movement, were rapidly brought to rest in the illuminated area. If the cell was moved slightly, the particles which had been unilluminated were seen to be in active movement, but within some forty seconds all had come to rest. The sol in question contained small quantities of sodium chloride and other electrolytes, and it is suggested that the illumination decreased the stability of the colloid sufficiently for these salts to bring about precipitation.

The phenomenon observed was not due to heating or drying up of the solution, since a water cell was interposed between the source of illumination and the slide, and also when a titan white suspension was substituted for the colloidal calcium oleate the particles remained in active movement during many hours of continuous illumination.

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British Colloids, Ltd.
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Points from Foregoing Letters

DR. W. B. LEWIS, W. E. Burcham and W. Y. Chang report that α-particles accompany the radioactive disintegration of lithium atoms (mass 8) into beryllium atoms of the same mass, with emission of an electron. These α-particles are attributed to the disintegration of excited ^{8}Be nuclei formed in the above reaction. It appears that the ^{8}Be is always formed in an excited state, and the lowest excess energy is not less than two million electron volts.

Attention is directed by Dr. M. S. Vallarta to a lack of agreement in the observed data concerning the intensity variation of cosmic rays with longitude. Some determinations show a maximum off the West African coast at long. 12° W., in agreement with the theory of Lemaître and Vallarta (assuming the position of the magnetic centre of the earth to be at about long. 160° E., as calculated by Schmidt). Hoerlin and Clay, on the other hand, find a maximum at long. 80° W., in the Pacific Ocean, which would place the magnetic centre at 100° E.

The changes brought about by the yellow oxidation ferment and Warburg's co-ferment consist, according to Prof. J. Kenner, in the removal of a proton and a hydrogen atom associated with an electron. He gives several examples of such reactions and suggests that they may likewise throw light on the function of methyl groups in the lactoflavin molecule in connexion with the activation of vitamin B_2.

The biological activity of corticosteron, a crystalline substance isolated by Reichstein from the cortex of the adrenal gland, is reported upon by a group of investigators from Amsterdam, Oss and Zurich. They find that its curative action upon dogs from which the adrenal glands have been removed, is about 2,000 times that of a standard 'cortin' solution, or 100,000 times that of fresh gland.

Benzoyl oxide and benzoyl peroxide have the property of stimulating growth in the same manner as the growth-hormone 'auxin'—according to experiments by R. Snow. The stimulation of growth was noted after applying the substances, mixed with lanoline, to one side of oat coleoptiles from which the tops had been removed.

Dr. E. L. Lederer compares his equation for the viscosity of binary mixture and that of Arrhenius with the equation recently suggested by A. J. A. van der Wyk, and states that the former two are to be preferred.

An equation for determining the molecular heat of a gas at a known pressure from the loss of energy of an electrically heated wire is given by Prof. H. S. Gregory and R. W. B. Stephens. Alternatively, taking as known the 'molecular' heat of a monatomic gas, it is possible to check the pressure readings of a McLeod gauge in the region of rarefied pressures.

A comparison is given by Dr. S. R. Khastgir of the observed values for the *volume* rectification ratio of carborundum with those calculated by means of a hypothesis which postulates that photo-electrons are set free when a voltage exceeding their binding force is applied. The values of the minimum potential differences needed are different for the two opposite directions of the current flow.

Curves showing the polarization of light of several wave-lengths in the solar corona, from photographs taken during the eclipse of 1934 by means of a specially equipped polarigraph, are given by Dr. W. M. Cohn. The author deduces that both 'bound' and free electrons are present in the solar corona.

The time lag of the vacuum photo-cell has hitherto not been measured, but it is usually assumed to be less than 3×10^{-9} sec. By a refinement of the rotating mirror method, Dr. R. A. Houstoun has managed to measure it for one cell, and finds it to be 5×10^{-10} sec.

Surfaces of pure metallic iron, if they have been at all exposed to air, show the presence of a film of oxide, Fe_3O_4, when analysed by means of the X-ray diffraction method. H. R. Nelson has investigated the orientation of the oxide lattice structure in relation to that of the underlying iron crystals and finds it similar to that which has been observed at higher temperatures in the case of 'FeO'.

While admitting that crystal size may have an influence on the yield point of heat-treated molybdenum wires, as suggested by Dr. E. W. Fell, it is stated by P. Túry and S. Krausz that in the particular case described by them the crystal size of the two samples was identical and the difference in the yield point must be attributed to the presence of nitrogen sorbed during nitriding.

R. W. Jack points out that changes in the fat content of tsetse flies should be allowed for when estimating variations in the 'water balance' of these insects, otherwise significant differences may be overlooked.