

precautions being taken. The results obtained in three capillary tubes of different radii show, for three samples (I, II and III) of more than 99 per cent heavy water obtained at different periods, a surface tension of 72.2 ± 0.5 dyne/cm. As may be seen from the accompanying table, this value does not differ from that known² for ordinary water, within the limits of our experimental error.

Measurements have been made also with 96 per cent and 94 per cent D₂O, the figures obtained being almost the same as those previously stated; densities and ascensions compensate each other similarly as in the case of 99 per cent heavy water.

On the basis of these preliminary measurements, we are inclined to believe that the values of surface tension of heavy and ordinary water most probably are equal or, in any case, the difference is very small.

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¹ *J. Amer. Chem. Soc.*, **55**, 4335; 1933.

² of H. Freundlich, "Kapillarchemie", vol. 1, p. 30; 1930.

Points from Foregoing Letters

H. FRÖHLICH and E. Guth claim that Temple's paradox (that if physical operators commute, Planck's constant is equal to zero), which would invalidate the greater part of the quantum theory, is due to the arbitrary way in which he chooses the product of three physical variables. Prof. Temple, while agreeing that in the case of triple products a unique form of representation cannot be derived, maintains that his deduction is as legitimate as that of Fröhlich and Guth. The paradox, he considers, really indicates that physical characteristics cannot be simultaneously described by classical variables and by quantum operators.

Prof. A. J. Dempster reports the observation by the mass-spectrograph of a uranium isotope of atomic weight 235, which is probably actino-uranium, the source of the actinium series of radioactive elements.

An X-ray polariser in which a cut section of a single crystal is used as scatterer is reported by Dr. W. H. George to give a beam of intensity 100-1000 times that of the standard methods.

Observations on infra-red light absorbed by ice, by water, and by heavy water dissolved in an organic liquid (dioxane) bring additional support, according to C. H. Cartwright, for a quasi-crystalline structure of water. The evidence favours a hindered translational frequency of D₂O or H₂O molecules, together with a turning of the four molecules surrounding the central vibrating molecule.

From a formula derived by Raman and Krishnan, relating optical and electro-magnetic properties of substances with molecular behaviour, Dr. R. J. W. Le Fèvre deduces that the polarisation of most substances in solution (as shown by the effect on the dielectric constant) should be less than in the vapour state; only those with a negative Kerr (magneto-optic) constant would show greater polarisation when dissolved than in the gaseous state.

Dr. I. W. Wark and Alwyn B. Cox describe instances of drops, apparently with contaminated surface, coalescing in several stages; they consider that the phenomena would repay study by means of a high-speed cinematograph.

Many British statisticians, Mr. H. J. Buchanan-Wollaston writes, assume that a test may be used simultaneously to show the untruth of one hypothesis and the truth of the reverse hypothesis. The reasoning employed, though often giving useful results, is open to objection and has apparently led to mistrust of these methods on the part of Continental statisticians.

The blue colour given by fish liver oils with antimony trichloride in chloroform solution has been used by Carr and Price as a rough indication of the

amount of vitamin A, though it is also produced by other constituents of the oils. A. Emmerie shows how the colour reaction is affected by saponification of the oils and describes a method used to obtain in concentrated form the constituents responsible for the Carr and Price reaction.

Dr. H. Laser describes how the respiration of the retina tissue of rats, and of mouse-cancer tissue, differs in phosphate and in bicarbonate media. Small amounts of hydrocyanic acid inhibit the respiration of retina tissue in presence of phosphates, but do not affect it in bicarbonate solution.

Chemical investigation of glycogen obtained from fish liver indicates that its molecule contains 12 glucose units and, according to Dr. David J. Bell, is identical with the glycogen obtained from the liver of rabbits.

Dr. V. Korenchevsky finds that, by the injection of a derivative of male sex hormone (androsterone) into female rats from which the ovaries have been removed, certain vestigial organs (periurethral glands) are stimulated to develop into a structure typical of the ventral lobe of the prostate of the male. He suggests that the two organs are homologous in the male and female.

Depigmentation in young rats described by Dr. F. J. Gorter is prevented or cured by addition of copper to the diet. He finds that the dosages required vary considerably in consequence of the availability of the copper fed to the rats and of certain dietary factors, which are always present to some degree in well-balanced rations and counteract the copper.

Vitamin C (ascorbic acid) appears to be a constituent of every living cell, according to experiments by Dr. Geoffrey Bourne and Russell Allen. Using acetic acid-silver nitrate reagent, which gives a black stain with vitamin C, they find small black granules scattered in the protoplasm in the cells of even the lowest organisms.

Further light on the plural nature of vitamin B is thrown by experiments, briefly reported by Prof. Albert G. Hogan and Luther R. Richardson, showing that alcoholic extract of rice, wheat germ oil and flavines, differ in their ability to cure dietary deficiency diseases in rats.

Dr. Susan Finnegan recalls the unique collection of 317 specimens of the rare African arachnid *Cryptostemma sjöstedti* presented to the British Museum by Mr. I. T. Sanderson and directs the attention of suitably placed collectors to the need of further specimens representing the thirteen living species of the order Podogona.