

unique so far in polysaccharide chemistry. From an inspection of models it appears either that the galactopyranose units are present in the form of a six-membered ring, or alternatively as a zigzag chain terminated by residues as yet undetermined. It is not yet possible to form an opinion on the 'fine structure' of the agar macro-molecule, whether for example the supposed sulphuric ester residues exist as cross-linkages, or indeed their approximate location. Further work will also be necessary to decide the constitution and mode of union of the acid portion of the hydrolysed product.

These investigations will be discussed elsewhere.

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¹ Percival and Sim, *NATURE*, **137**, 997 (1936).

² Haworth, Raistrick and Stacey, *Biochem. J.*, **29**, 2668 (1935).

³ Challinor, Haworth and Hirst, *J. Chem. Soc.*, 258 (1931).

⁴ Onuki, *Chem. Zentr.*, **II**, 367 (1933).

The Theory of Dimensions

IN reviewing Dr. F. W. Lanchester's book "The Theory of Dimensions and its Application for Engineers" in *NATURE* of January 9, I stated with

regard to Appendix VI that "in my opinion the author was unwise to include this section in a book the avowed object of which is to help the young engineer". Dr. Lanchester has written to me pointing out that although this was the primary object of writing the book, it is stated in the preface that the author hopes that it "may be found of service to others besides those to whom it is primarily addressed. As a book of reference for workers in the physical laboratory, auxiliary to existing works on the same subject, it may prove of service as conveying its message in a simple and direct manner".

I should be sorry if the book were prejudiced in any way by my reference to what was only the primary object as the avowed object. In an editorial reference to the book in the *Wireless Engineer*, I remarked that "like many another book written avowedly for the young, it will be read with enjoyment and profit by many who are no longer young; in fact, the latter class of reader will be better able to appreciate the vigorous attempts to extirpate dimensional heresy—that is, anything with which the author does not agree".

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Points from Foregoing Letters

THE effect of substituting deuterium for hydrogen on the intermolecular bonds of oxalic acid has been examined by Dr. J. Montcath Robertson and A. R. Ubbelohde using X-ray methods. A small expansion of the lattice occurs, mainly in the direction of the deuterium bonds, an effect which throws light on the mechanism of the hydrogen bond, and promises to be of value in locating certain types of hydrogen linkage in complex structures.

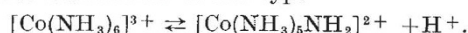
In order to predict the shape of the curve expressing the energy distribution of the electrons emitted in radioactive transformations, several formulæ have been proposed, based on the theory that (unobservable) neutrinos are simultaneously emitted. Dr. H. O. W. Richardson points out that the equation of Fermi fits low-energy transformations, whilst that of Konopinski-Uhlenbeck applies in the case of high-energy electrons.

Diagrams of the rate of sedimentation of ovalbumin in water solution (buffered at pH 6.0) and in 50 per cent urea solution, are given by Prof. J. W. Williams and Dr. C. C. Watson. The data indicate that, in urea solution, the ovalbumin is dissociated into a product of approximately half the molecular weight in water solution. This dissociation appears to be reversible.

The presence of an absorption band in the region of 2.7μ in various organic compounds containing O—H groups is discussed by Dr. J. J. Fox and Dr. A. E. Martin. A curve showing the infra-red absorption of benzyl alcohol in carbon tetrachloride, showing both the O—H absorption band and the 'association' band is submitted. The authors state that replacement of hydrogen by phenyl groups suppresses intermolecular association.

Dr. J. S. Anderson, N. L. Spoor and Prof. H. V. A. Briscoe report that the rate of interchange between water and hexammine cobaltic chloride containing deuterium is independent of the heaviness of the salt at any given concentration, and

for salt of given heaviness varies inversely as the hydrogen ion concentration and inversely as the square root of salt concentration. These facts suggest the explanation (independently reached by F. J. Garrick) that co-ordinated ammonia can undergo an acid dissociation of the type



Dr. C. H. Douglas Clark has reviewed methods available for the calculation of the band spectral constants of di-atoms, and has introduced a formula connecting the fundamental vibration frequencies a , b and c of members of a diatomic triad XY , XX and YY , respectively, which belong to 'symmetrical' molecular groups, as follows: $a^3 = 0.8bc^2$

Tropical timbers show on the whole less resistance to impact, though greater strength under compression parallel to the grain, than north temperate zone timbers of the same specific gravity. S. H. Clarke suggests that the differences in strength properties are caused by growth conditions acting through the medium of the cell wall composition.

Prof. E. A. Werner directs attention to the fact that urea, a non-hygroscopic substance under ordinary conditions, can absorb one and three-quarter times its weight of water when exposed to air saturated with moisture. This rather remarkable result for a substance which separates from aqueous solution in an anhydrous form is discussed in connexion with the marked contrast in the behaviour of urea, urea hydrochloride and urea nitrate towards water absorption under similar conditions.

The hydrolysis of completely methylated agar-agar yields as the main product a trimethyl galactose which appears to be 2:4:6-trimethyl galactose. Dr. E. G. V. Percival, Dr. J. Munro and J. C. Somerville consider it probable therefore that portion of the polysaccharide which is derived from galactose is composed of β -galactopyranose units linked at positions 1 and 3.