

difference could be observed in the amounts of CO and CO₂ produced in a given time in a series of vessels ranging from a 161 c.c. bulb down to a 1 mm. capillary tube, despite the fact that polymerisation in the narrow tubes was sufficiently rapid to cause a considerable diminution in pressure instead of the usual increase due to the reaction $2\text{H}\cdot\text{CHO} + \text{O}_2 \rightarrow 2\text{CO} + 2\text{H}_2\text{O}$. However, when a tube packed with powdered Pyrex glass was substituted, the course of the reaction changed and the gaseous product consisted almost entirely of CO₂. Packing has a similar effect on the course of the oxidation of acetylene⁴, but the rate of production of CO falls off rapidly

when the diameter is decreased below 6 mm.⁵ This critical region of diameters, if it exists, must lie well below 1 mm. in the case of formaldehyde, yet the other characteristics of the reaction are certainly indicative of a chain mechanism.

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¹ Carruthers and Norrish, *NATURE*, **135**, 582; 1935.

² Semenoff, "Chemical Kinetics and Chain Reactions", p. 367.

³ Semenoff, *Z. phys. Chem.*, **28** B, 54; 1935.

⁴ Kistiakowsky and Lenher, *J. Amer. Chem. Soc.*, **52**, 3785; 1930.

⁵ Spence, *J. Chem. Soc.*, 686; 1932.

Points from Foregoing Letters

THE addition of echo sounding gear to the *Johan Hjort* enabled that vessel to reveal unsuspected features of the flooring of deep fjords, and to locate swarms of spawning cod in the neighbourhood of Lofoten. These, writes Oscar Sund, were mainly in a layer of 10–12 metres thick at a constant depth where a somewhat lower oxygen concentration and greater acidity could also be detected.

Prof. S. K. Mitra and P. Syam report the detection of radio waves returned from a height of only 55 km. Although these have only been detected occasionally, the authors believe that the ionised layers to which the effect is due exist usually in a diffused form which strongly absorbs longer waves, and affects the virtual height of the Kennelly-Heaviside region above it.

An error in sign (later corrected) in Prof. Sommerfeld's original paper on the attenuation of radio waves had led to the prediction of a zero field intensity at finite distances from a radio transmitter. K. A. Norton points this out and gives a new empirical formula for the field intensity, applicable, however, only to a plane earth.

The existence of a cadmium isotope of mass 118 has been deduced from the band spectrum of the light emitted by cadmium hydrides, but has not been identified by means of the mass-spectrograph. Gösta Stenvinkel and Erik Svensson claim that the evidence from the spectrum of the light emitted by the hydrides is conclusive, as is shown by its ability to detect the existence of other known isotopes of cadmium and zinc, for which the mass-spectroscopic evidence is conflicting.

The introduction of heavy hydrogen in place of the ordinary variety in organic compounds changes the Raman spectrum of the light scattered by those compounds. From the shift observed in certain spectrum lines of benzene, A. Klit and Dr. A. Langseth associate some of the spectrum lines with the structural characters of the benzene molecules.

The neutrons spontaneously emitted by phosphorus previously bombarded with other neutrons (from a radon-beryllium source) may possess more than four million volts energy. In I. Gurevich's view, neutron emission is a secondary process, and not a primary process as suggested by Curie, Joliot and Preiswerk.

From the general principles of the quantum theory, Prof. G. Temple deduces the paradox that any two 'operators' which represent physical variables must commute. This would make Planck's constant zero.

The arrangement of the chromosomes during cell division in the pollen tube of the tulip is found by

Miss M. B. Upcott to be normal, unlike the behaviour reported by O'Mara in the case of the *Lilium regale*. From measurements of the structures involved, Miss Upcott concludes that the whole volume of the chromatid is taken by a chromosome thread compactly coiled.

Prof. H. H. Dixon submits photomicrographs of coal by reflected light, taken with the 'ultropak' type of microscope in which the light is introduced laterally into the body of the microscope, and reflected downwards by an annular mirror.

The addition of orange juice to sea-water quickens the development of the sea-weed, *Laminaria saccharina* (sugar wrack) in its early stages, the greatest growth being observed in submerged germlings. P. W. Carter gives diagrams showing this effect, and also that of the addition of potassium salts.

As a contribution to the discussion on the palatability of butterflies, L. Glauert writes that he has observed the Australian butcher-bird catching specimens of the species *Anasynta sphenosena* even when not driven by hunger.

Experiments by Profs. J. W. Cook and E. C. Dodds fail to confirm the recent observations of E. Friedmann on the cestrogenic activity of sodium benzylidene-pyruvate and sodium furylidene-pyruvate upon rats.

In order to explain the progressive increase in the shearing force needed, and the irreversible deformation with temperature in the case of experiments with rock-salt, Dr. W. G. Burgers and J. M. Burgers propose a combination of the theories of Taylor and of Becker-Orowan. The new theory, it is claimed, also explains the increased plasticity of rock-salt in process of solution, ascribing this behaviour to a surface effect, as against Smekal's hypothesis of internal cracks.

Nickel-iron wires of high permeability show an abnormal 'skin effect' (mainly surface conduction, owing to increased internal resistance) for low audio-frequencies. An external magnetic field increases the resistance. Dr. E. P. Harrison, G. L. Turney and H. Rowe give graphs showing the variation of the resistance with current strength and with the external magnetic field.

The presence of powdered glass changes the course of polymerisation and decomposition of formaldehyde (at temperatures up to 317°), producing carbon dioxide instead of carbon monoxide and water. Dr. R. Spence interprets this effect as due to the breaking of the reaction chains owing to deactivation of active molecules by collision with increased surface.