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Apicultural Problems

Rothamsted Research

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- LXVIII. R. J. BEST and G. SAMUEL. "The Effect of Various Chemical Treatments on the Activity of the Viruses of Tomato Spotted Wilt and Tobacco Mosaic." *Annals of Applied Biology*, 1936, Vol. XXIII, pp. 759-780.

The virus of tomato spotted wilt is inactivated rapidly in the presence of free oxygen, and at room temperature even in its absence. Addition of reducing agents protected against inactivation for a time, but oxidising agents accelerated it. The effect of a number of other substances was examined. Tobacco mosaic virus was similarly tested with fifteen chemicals, of which only KMnO_4 and chlorazene caused rapid inactivation.

- LXIX. J. CALDWELL. "Factors Affecting the Formation of Local Lesions by Tobacco Mosaic Virus." *Proceedings of the Royal Society of London, B*, 1936, Vol. CXIX, pp. 493-507.

A possible method is suggested for determining whether the reducing effect on infection caused by additions to virus juice is an action on the virus itself or on the host plant. The effect of various enzymes, of normal serum and of silver nitrate is examined experimentally and found to be due to action on the virus.

- LXX. F. M. L. SHEFFIELD. "The Susceptibility of the Plant Cell to Virus Disease." *Annals of Applied Biology*, 1936, Vol. XXIII, pp. 498-505.

Spraying experiments show that virus cannot enter a plant unless some of the cells are injured, the number of infections falling off as the time after the injury increases. Micropipette inoculation into single cells gives only about 10 per cent. of successful infections.

- LXXI. F. M. L. SHEFFIELD. "The Rôle of Plasmodesms in the Translocation of Virus." *Annals of Applied Biology*, 1936, Vol. XXIII, pp. 506-508.

Although intracellular inclusions may occur in every cell over large areas of the epidermis, none has been found in the guard-cells of the stomata. No protoplasmic connections could be found between the guard-cells and the surrounding tissues. These facts support the view that virus is carried from cell to cell by the protoplasmic bridges, when it moves in the ground tissue of the host.

APICULTURAL PROBLEMS

(Section for Bee Investigations, and Physics Dept.)

- LXXII. H. L. A. TARR. "Bacillus alvei and Bacillus para-alvei." *Zentralblatt Bakteriologie*, 1936, Vol. XCIV, pp. 509-511.

It was found that *B. alvei* can be distinguished from *B. para-alvei* by the change in shape of the vegetative cell during sporulation, and by the form of the endospore produced. In other respects the organisms were apparently identical.

- LXXIII. H. L. A. TARR. "Studies on European Foul Brood of Bees. II. The Production of the Disease Experimentally." *Annals of Applied Biology*, 1936, Vol. XXIII, pp. 558-584.

Experiments showed that *Bacillus alvei* and *Streptococcus apis* would not infect healthy colonies of bees directly, but would do so when first used to inoculate larvae which were starved and were subsequently introduced into the colonies after infection had developed. It was also found that a filterable virus is in no way implicated as cause of the disease, the etiology of which is not yet certain. Two varieties of *S. apis* were found and these have recently been shown to be apparently identical with *S. liquefaciens* and *S. glycerinaceus*.

- LXXIV. G. W. SCOTT BLAIR and D. MORLAND. "A Physical Test for Ling Honey." *Journal of the Ministry of Agriculture*, 1936, Vol. XLIII, pp. 653-657.

There is considerable confusion among bee-keepers as to the distinction between density and viscosity of honey. The general significance of the two properties is explained, and the importance of viscosity is discussed. Honeys

from many floral sources have been examined, and all except those derived from *Calluna vulgaris* and *Leptospermum scoparium* are found to have viscosities which are unaffected by stirring. Honey from these two exceptional plants increases in viscosity on standing undisturbed, but the viscosity decreases on stirring. This property, well known in many other materials is called thixotropy.

A simple method for measuring the thixotropy of honey is described in detail. Thixotropic honeys can hold more water without fermenting than can non-thixotropic honeys, and for this and other reasons, the property is of practical importance.

An investigation is in progress on the effect of soil, climate, and elevation on the thixotropy of ling honey.

TECHNICAL AND OTHER PAPERS

GENERAL

- LXXV. C. B. WILLIAMS. "A Modified Greenwich Night-Cloud Recorder used for Ecological Work." *Journal of Animal Ecology*, 1936, Vol. V, pp. 348-350.

An apparatus is described which by photographing the track of the pole star at night gives an indication of when this is obscured by cloud and hence an average measure, in these latitudes, of the cloudiness of the night sky. The apparatus will not work in the tropics or the southern hemisphere.

- LXXVI. R. K. SCHOFIELD and G. W. SCOTT BLAIR. "Bemerkung zum Mechanismus der Spinnbarkeit." *Kolloid-Zeitschrift*, 1937, Vol. LXXIX, p. 308.

If a glass rod dipping into certain materials is withdrawn, Erbring has shown that strands of material can be formed, the length of strand depending on the rate of withdrawal, and on a property of the material which he calls "Spinnbarkeit" (Fibrosity).

It is shown that certain honeys called in the trade "stringy" are fibrous, and that when a drop of fibrous honey is extended into a strand on a mercury bath its behaviour is highly elastic, the strand reforming into a spherical drop when the stress is released. The phenomenon is believed to be akin to work-hardening in flour doughs. (See Paper VII in 1932 Report.) Fibrous honeys appear to obey Poiseuille's law fairly exactly when caused to flow through capillary tubes.

- LXXVII. G. W. SCOTT BLAIR. "Ein Mikroviskosimeter für Nicht-Newton'sche Flüssigkeiten." *Kolloid-Zeitschrift*, 1937, Vol. LXXVIII, pp. 19-21.

An apparatus is described for measuring the viscosity of small samples of materials. It is especially suited to determine the extent of deviation from Poiseuille's law in the case of non-Newtonian liquids and thixotropic systems, and gives an empirical measure of degree of thixotropy.

- LXXVIII. R. K. SCHOFIELD and G. W. SCOTT BLAIR. "Influence of Viscosity Variation on the Rupture of Plastic Bodies." *Nature*, 1935, Vol. CXXXVI, p. 147.

- LXXIX. B. A. KEEN. "A Preliminary Report on the Behaviour of the Ashby and Owens Evaporimeters." Ministry of Agriculture Report on Agricultural Meteorological Conference, 1935.

- LXXX. HUGH NICOL. "Quiescence at the Surface of a Liquid Disturbed by at least Two Agencies." "The School Science Review," 1936, pp. 87-90.

CROPS, SOILS AND FERTILISERS.

- LXXXI. E. J. RUSSELL. "Soils and Fertilisers." *The Farmer's Guide to Agricultural Research in 1935*. Royal Agricultural Society of England, 1936, pp. 177-229.