of the tree to nitrogenous fertilizers, and to the conditions favorable for infection by the endophyte".

Mycorrhizal structure as observed in *Citrus* under cultivation in California is similar to that found in the same species under natural conditions. The remarkably wide geographical distribution of this 'Phycomycete type' of mycorrhizal association, its prevalence in plant species of the most diverse affinities, together with its recorded appearance in certain crop plants, prompts me to urge once again the need for expert diagnosis of root condition in respect to mycorrhizal equipment as an index of soil environment favourable or the reverse, and as a guide to efficient manurial treatments of crops showing regular mycorrhizal associations.

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[2] Reed, H. S., and Th. Frémont, "Factors that Influence the Formation and Development of Mycorrhizal Association in Citrus Root", *Phytopath.*, **25**, 645; 1935. "Sur les réactions des cellules des racines de Citrus à l'infection par les mycorrhizes", *C.R. Acad. Sci.*, **199**, 84; 1934. "Les arbuscules des mycorrhizes endotrophes", *C.R. Soc. Biol. Paris*, **116**, 201; 1934.

Electrical Conductivity of Copper Oxide Films Showing Interference Colours

THE measurement of the electrical resistance of films of copper oxide on copper showing interference colours of the first order has given results varying from 0·002 to 15 ohms per sq. cm. at 25° C. On massive copper surfaces the temperature coefficient of the resistance is positive and somewhat less than that of metallic copper, while the resistance measured is very small, lending support to the view that the very fine structure of the film is very heterogeneous and minute areas of metal are probably exposed. These areas are too small for the microscope and spectrophotometer to show their presence.

With activated surfaces the electrical resistance is very much higher, and the temperature coefficient is negative, like that of the oxide. Although the surface colour showed striking homogeneity in many cases, shearing and breaking the metal showed a considerable thickness (up to 10^{-3} cm.) of activated film and graded colour sequences through the fracture corresponding to thinner films on the granules as the distance from the surface increased.

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Points from Foregoing Letters

THE variation of the dielectric constant of ionised air with wave frequency has been determined by Prof. S. K. Mitra and S. S. Banerjee. Their findings verify the Eccles-Larmor theory, which demands that the dielectric constant of an ionised gas should be less than unity, and shows that owing to the conductivity acquired by the ionised air, an anomalous increase of the dielectric constant is recorded.

Prof. P. K. Sen-Gupta adduces several arguments to substantiate his claim that nitrous oxide gas, N_2O, is broken down into NO and N by ultra-violet light of wave-lengths 2750, 1850 and 1580 A. (in which regions nitrous oxide has absorption bands), and not by wave-length 2140, at absolute zero, as claimed by Henry.

A photograph indicating the electron diffraction pattern obtained with powdered vitreous silica is submitted by N. A. Shishacow. Unlike the photographs obtained with the same material with X-ray of wave-lengths 1·54 A., the photograph obtained with electrons, the energy of which corresponds to a wave-length of 0·06 A., and have a correspondingly greater resolving power, shows distinct rings, indicating the presence of tetragonal cristobalite crystallites constituting the vitreous silica.

By bombarding nickel with neutrons from a powerful radon-beryllium source, J. Rotblat has succeeded in producing radioactivity of two life periods, of twenty minutes and two hours respectively. He ascribes the longer-lived product to the formation of an unstable nickel isotope of mass 59 or 63, and the shorter radioactivity to radioactive cobalt of mass 60, formed from nickel-like atoms of the same mass. Mr. Rotblat has further obtained the radioactive cobalt of the same life-period by bombarding cobalt of mass 59 with neutrons.

Dr. V. V. Narlikar and K. V. Sastry direct attention to a new formula for a line-element, which may prove of great interest in the relativity theory of world-structure.

New measurements of the density of heavy water, by Dr. L. Tronstad, J. Nordhagen and J. Brun, give 1·10714 as the nearest approach to the correct value at 20°C. The authors suggest that the higher value obtained by Taylor and Selwood may be due to a higher proportion of heavy oxygen in the samples employed. The density of the purest light water (free from the heavier variety) was found to be 0·9999815.

Bacillus tumefaciens injected into the stems of tomato plants produces characteristic tumours of a given average size. László Havas, by injecting aqueous solutions of sex hormones, finds that the average size of the plant tumours above the site of the injection increased, while those below the site of injection decreased. Further work is necessary before it can be determined whether the direction of migration of the hormone is constant, and whether it varies with physiological and toxic doses.

Vitamin C, added to sterile plant cultures, leads to an increase of 35–75 per cent in the dry weight of the plants, according to experiments reported by Dr. Synnöve v. Hausen. This increase is due to ascorbic acid specifically, and not merely to the addition of an organic substance, since controls using glucose produced no such increase. The greatest differences were obtained during flowering.

Recent publications by Prof. H. Reed and Mlle. Frémont from the Citrus Experimental Station, University of California, confirm views expressed in NATURE by Dr. M. C. Rayner respecting the practical significance of the mycorrhizal habit in *Citrus* cultivation. The necessity for expert diagnosis in other crop plants showing similar root relationships is urged.