DISCUSSION AND CORRESPONDENCE

THALLIUM AS AN INSECTICIDE

THE remarkable properties of the metal thallium and its salts have recently been the subject of considerable research among biochemical workers, and thallium sulphate has attained some commercial use as a poison for rodents, both in this country and Europe. W. J. Dilling (Ann. Appl. Biol., XIII, 165–167, 1926) found that thallium ion was potent in checking both growth and germination in the seeds of cress, and that tadpoles were killed on emergence from the egg by N/500,000 solutions of thallium nitrate. Small doses of thallium acetate caused rats to lose all their hair except the tactile hairs (Buschke and Peiser, Klinische Wochenschrift, V. 977, 1926).

The writer knows of no experiments toward determination of the toxicity of thallium to insects. Its present price appears to make improbable its application to large scale economic entomological operations. Nevertheless, experiments undertaken in a small way during the past spring and summer indicate that thallium sulphate has a limited field in the control of house ants. The small red ant (*Monomorium pharaonis* L.), a species which arsenic sirups fail to control, has been exterminated in a number of houses and apartments within periods of three weeks to a month by the application of a sirup prepared by the writer and consisting of ½ pint water, 1 pound sugar, 27 grains thallium sulphate and 3 ounces honey, the whole being brought to a boil and thoroughly stirred. The ants continue to consume this sirup until the entire colony is destroyed, the thallium appearing to act as a slow cumulative poison, the effects of which are apparent in observable colonies by the considerable numbers of dead queens, larvae and workers discarded daily. The pavement ant (*Tetramorium cespitum* L.) is even more readily controlled, while several other species have shown themselves susceptible. The value of this poison on other insects is being tested.

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"PINK-ROOT" OF ONIONS CAUSED BY PHOMA SP.

WITH the rapid development of the onion industry in the west and southwest there has been a corresponding increase in loss from the "pink-root" disease. For this reason considerable time and effort have been devoted, at this laboratory and elsewhere, to studies of the various phases of this disease. Taubenhaus[1] presented evidence that, in Texas, the causal organism is a species of *Fusarium,* which he named *Fusarium malli* Taub. Later, in California, Sideris[2] isolated and named four new species and two new varieties of *Fusarium* which he had found associated with the disease.

The writer of this note, also working in California, has observed that the extent and diversity of the cryptogamic flora obtained when diseased onion roots are cultured depend largely on the condition and treatment of the material used. If the roots cultured are partly decayed and shrivelled they yield a large number of *Fusaria* and several other members of the soil flora; if, on the other hand, roots are cultured that, though distinctly pink, are still turgid and firm, the number of fungi obtained is greatly reduced, and if roots in the same condition are immersed in mercuric chloride 1:500 for three minutes and then cultured only one fungus is obtained which, according to the following description, belongs in the genus *Phoma:* Pycnidia subglobose, gregarious, dark-brown to black, 170–250 μ, conidia oblong, hyaline, one-celled 3–3.5 x 1.2–1.5 μ escaping as a gelatinous cirrus.

Typical "pink-root" symptoms, a diffuse pink color, followed by shrivelling of invaded parts, were readily produced in roots of onion seedlings grown in sterilized soil inoculated with *Phoma sp.* The organism was reisolated in pure culture from affected parts.

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THE VELOCITY OF GRAVITATION

FOR many years the velocity of gravitation or more properly the velocity of propagation of gravitational potential has been the subject of much theoretical discussion. The magnitude of this velocity according to proposed theories varies from the velocity of light to infinity. According to the theory of relativity the velocity of gravitation should be equal to that of light and the success which the experimental tests of the theory have met justify this assumption. No previous work has been done, however, which would form the basis of a direct measurement. During the past year certain experiments relating to the velocity of gravitation have been devised and partially tested but since no immediate results may be expected it seems best to make note of the method employed.

The attractive force of the sun on a mass situated on the surface of the earth varies by small amounts

[1] Texas Agr. Expt. Sta. Bull. 273: 1–43. 1921.
[2] *Phytopathology,* 14: 211–216. 1924.