physiologic forms of *P. graminis avenæ* and, at the present time, other fungal spores are being investigated. If it may be assumed that the mycelia react in the same way as the spore and its germ tube to light of different wave-lengths, then these observations suggest some very interesting possibilities.

In a letter such as this it is not possible fully to outline the complete observations of these preliminary investigations; in consequence the results so far obtained with certain of these physiologic forms of rust and with other fungi, will be communicated elsewhere, and the work will be continued.

W. A. R. DILLON WESTON.
Dominion Rust Research Laboratory,
Winnipeg, Man., June 1.

Ultra-Violet Rays and Mosquito Larvæ.

RECENT work which I have been conducting at this laboratory on the possible effect ultra-violet rays may have on the activation of ovarian function in female mosquitoes, has disclosed the fact that mosquito larvæ are highly susceptible to a remarkable form of injury by radiations from the unshielded mercury-arc generated by the ordinary Cooper-Hewitt vacuum type of quartz lamp.

Larvæ in water contained in open watch-glasses when exposed to the rays at 12 inches from the lamp immediately exhibit an intense irritation. After an irradiation of 3 minutes' duration there is evidence of partial paralysis, in that the larvæ show signs of slight ventral curvature while resting at the water surface; otherwise, they are apparently normal in their responses and swimming movements. However, if such larvæ are kept under close observation, the rapid development of a progressive type of injury is made evident within a few hours. The paralysis increases, the ventral curvature becomes more and more pronounced, and usually by 6 hours after irradiation severe injury to the internal tissues is distinct. The injury takes the form of a progressive histolysis of the connective tissue, muscles, fat-body, etc., first along the dorsal region of the thorax and abdomen, then gradually extending to the underlying tissues, until ultimately the larvæ, bereft of a large mass of tissues, present an astonishing appearance. The chitinous integument is itself unaltered, and consequently extensive internal spaces are formed where tissue histolysis has taken place. These spaces, filled with the fluid product of histolysis, are perfectly transparent except for the ramifications of the tracheæ, and finally, the still living larvæ are reduced to a condition where only a comparatively narrow band of tissues remain along the ventral region of the body. The larvæ are then practically immobile, lying at the bottom of the water-container, but the action of the heart continues feebly for some length of time, even after the respiratory system has completely collapsed by paralysis of the constrictor-dilator nerve-muscle mechanism.

Under the rays of a lamp which has not operated for more than a total of 150 hours, the minimum duration of exposure necessary to produce fatal injury of this nature in the larvæ of both *Aëdes* (*Stegomyia*) *ægypti* L. and *Culex* (*Culex*) *pipiens* L. has been found to be a period of 45 seconds. The rate of the induction of these tissue changes is directly proportional to the duration of irradiation over fairly wide intervals, while the period occupied by the progress of the process, and before the ultimate death of the larvæ occurs, is inversely proportional to the duration of the irradiation.

Two distinct types of injury have been revealed. (1) A direct injury to the motor nervous system indicated by immediate partial paralysis of certain muscles, and the inhibition of the pulse-rate and tone of the heart. The heart is one of the first organs to suffer injury, but, strangely enough, is the last to be put entirely out of action. (2) An indirect injury leading to the progressive dissolution of many tissues, though principally affecting the fat-body.

The radiations responsible for these remarkable effects have been traced by the use of filters and subsequent spectrographic analysis to the band 2150-2850 A., the most effective radiations being apparently below 2500 A. A possible cause of the tissue histolysis and other injury would seem to be the disturbance of the normal electrostatic conditions within the living cell by absorption of the quanta of the lethal rays.

A full account of my investigations and the results of various experiments to determine the histological nature of the injury will be published in due course.

MALCOLM E. MACGREGOR.
Wellcome Field Laboratory
(Wellcome Bureau of Scientific Research),
Wisley, Surrey.

The Form of Fæcal Pellets and Specific Identification.

WHILE at Oslo, Norway, in 1927, I devised a bottom sampler capable of withdrawing a core of mud from the sea bottom, and at the same time preserving, as *in situ*, the surface layer. My object was to examine this upper layer of flocculent detritus with reference to its possibilities in providing potential food for bottom-living organisms. A description of this instrument with slight modifications was published by Moore in the *Jour. Marine Biol. Assoc.* (vol. 16, No. 2, pp. 589-594). When examining samples which I collected in the Clyde Estuary, I was struck by the characteristic form and sculpturing of fæcal pellets found in them, and, by keeping various members of the bottom fauna in captivity, was able to determine from which particular organism these fæcal pellets were derived.

Doubtless Mr. Moore [1] will remember my discussing the matter with him at Millport Marine Laboratory in 1929 before he commenced his investigations on marine muds.

I may mention here that a distinct stratification in the core extracted from the bottom was noticeable, and my examination showed that successive layers were characterised by fæcal pellets derived from different species, and in some cases different groups, of organisms. A history of the nature of the population in a specific area over a period was thus possible.

Not only were these layers characterised by the fæcal pellets of different organisms, but also they registered more or less faithfully the amount of land drainage in the particular neighbourhood.

I was therefore interested to read in Mr. Moore's letter that he has been so successful in his investigations, which in part confirm my observations. The detailed published results of his work should be valuable.

RODERICK MACDONALD.
Marine Laboratory, Egypt,
June 18.

[1] NATURE, May 30, p. 818.

The Theoretical Magneton Numbers in Weiss Units.

As in several cases the experimental ionic magneton numbers may be regarded as established to within a few hundredths of a Weiss magneton, and as, on the other hand, the theoretical values given by Hund,[1] Laporte-Sommerfeld,[2] and Bose-Stoner [3] are accurate only to a few tenths of a magneton, it may be useful