slips. In contrast, the cells adhered well to the surface of glass coverslips which were used without any treatment other than rubbing with a paper tissue, though the numbers adhering were somewhat variable. As the principal difference between untreated coverslips and those which had been boiled in water and washed with alcohol was likely to be the existence of a layer of an oily substance at the glass surface, a defined layer of a fatty acid was deposited on the coverslips by a modification of the method of Blodgett[2].

A glass dish, 20 cm in diameter and 5 cm deep, was filled with distilled water and 0·02 ml. of B.D.H. redistilled oleic acid was dropped on to the surface of the water. The bulk of the oil remained as discrete lenses and the rest spread as a monolayer due to the dipolar nature of the acid[3]. A coverslip, previously cleaned by boiling in water and drying in absolute alcohol, was held in a vertical plane and dipped in the water at a part remote from the oil lenses and the dipping was repeated five times so that a multi-molecular layer of oleic acid was deposited on the glass surface. The excess of water was allowed to drain and the coverslip was dried by standing vertically at room temperature.

A suspension of white blood cells was prepared by dispersing the buffy layer of blood in Medium 199[4], and the polymorphs were deposited on coverslips within 1 cm × 1 cm areas, marked out by 'Speedry' marking ink (Speedry Products Ltd., Beckenham, Kent) by allowing 0·05 ml. of the suspension to sediment for 5 min in a moist chamber containing an atmosphere of 5 per cent carbon dioxide[1]. Microscopic counts with a calibrated eyepiece graticule showed that the number of polymorphs adhering to a series of multilayered coverslips was more than twice that adhering to a series of alcohol-treated coverslips, when the same cell suspension was deposited.

The oleic acid layer did not appear to affect the behaviour of the polymorphs. Using rice starch as a test particle, the average percentage phagocytosis (87) observed in a series of polymorph populations deposited on multilayered coverslips was no different from the average percentage phagocytosis (89) in a similar series of cells on alcohol-treated coverslips. Similarly, no significant difference was found between serum concentrations required to promote phagocytosis of hydrocarbon particles by 50 per cent of populations of polymorphs[1] deposited on either multilayered or alcohol-treated coverslips. The major difference between preparations deposited on coverslips multilayered with oleic acid and those deposited on alcohol-treated glass thus appeared to be the increased ability of the polymorphs to adhere to glass surfaces on which there had been deposited a layer of the fatty acid. This greater ability to stick made the scoring of quantal phagocytic responses much easier.

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Observation of Root Feeding by the Nematode *Trichodorus viruliferus* Hooper

Observation through the glass panels of an underground root observation laboratory[1] and subsequent sampling for detailed study have shown a high proportion of the white growing tips of extending apple tree roots to be attacked by the ectoparasitic nematode *Trichodorus viruliferus* Hooper. Colonies of 10 to more than 100 individuals congregated 1–3 mm behind the apical meristem of suitable roots (about 1 mm in diameter), rasping the epidermis and hypodermis with their stylets and causing a superficial but characteristic browning. Severely damaged portions of the root often swelled and occasionally their surface split. Root extension usually ceased after 5–15 days of feeding, although the meristem itself was not the focus of attack. Once growth had ceased most of the nematodes dispersed within 1 or 2 days. The damage to the root tip was essentially the same as that associated with the 'stubby root' symptom in many herbaceous hosts, which has been ascribed to other species of this genus in the United States[2]. In extending apple roots, however, it was not accompanied by the characteristic branching and stopping of secondary and tertiary roots.

T. viruliferus comprised 95 per cent of the plant-parasitic nematodes recovered from the surface of roots withdrawn through removable panels, and rhizosphere soil from the same roots yielded 93 per cent, the remainder in each case consisting of *Paratylenchus* spp. Extending roots of the same trees, recovered by digging 2–4 ft. away from the trunk, yielded 85 per cent *T. viruliferus*, the remainder being *Paratylenchus* and *Tylenchorhynchus* spp. Soil sampled by auger from the same root zone and elutriated by conventional techniques yielded 7 per cent *Trichodorus* spp. and 81 per cent tylenchid genera (*Paratylenchus*, *Tylenchorhynchus* and *Pratylenchus* spp.). It appears, therefore, that *T. viruliferus* is concentrated on the surface (rhizoplane) and in the rhizosphere of roots to a far greater extent than the tylenchids, which form the majority of the soil population of root parasites. The detection of associations such as this would be difficult by the commonly used soil sampling and processing techniques, illustrating the potential of a root observation laboratory, with its facilities for direct observation and sampling and indirect study by means of time-lapse photography.

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Parasitism by Larvae of *Unionicola intermedia* Koenike, and another *Unionicola* sp. (Acarina, Pionae), on Chironomids

The majority of water-mites for which the life-histories are known have a parasitic larva and free-living nymphs and adults. The family Unionicolidae, however, has always been separated from the remaining families due to the fact that most species have adults and nymphs which are parasitic in the mantle cavities of fresh-water mussels. It has generally been assumed that these mussel parasites have been free-living as larvae and that the larval stage has been of brief duration and has served merely as a means of dispersal. There have, moreover, apparently been no previous records of these larvae being found outside their hosts.

During August and September of the past two years I have collected considerable numbers of the midge *Chironomus plumosus*, L., and on 64 out of 82 examined from three such collections I found 510 mite larvae referable to the genus *Unionicola*. These larvae have been identified as *U. intermedia*, Koenike, and probably *U. aculeata*, Koenike.

The former has been known since the time of Bonz (1783) as a parasite in its nymphal and adult stages of the mussel *Anodonta anatina*, L., while the latter is stated by Mitchell[1] to use mussels as sheltering places for its pupal stages but otherwise to be free-living.

It seems, therefore, that the larvae of these two members of the genus behave in a manner precisely similar to the