promotion of growth by auxin in oat tissues is dependent on the concentration of the hormone, varying from a few minutes at high concentrations to more than an hour at low concentrations. At 21° C, and with 10⁻³ molar IAA, the lag was of the order of twelve minutes—just long enough for gene activation to occur. At 40° C, however, even this short lag was reduced to zero.

These results weigh heavily against the idea that either derepression of genes or the stimulation of protein synthesis are the primary targets for the action of auxin. There is much evidence that auxins influence the metabolism of nucleic acid and protein, but this may well consist of secondary effects. Nissl and Zenk suggest that the primary site where auxin acts must be a pre-formed system, already present in the cells and awaiting the auxin "trigger". Such a system might involve the activation of a molecule which could cleave and redistribute macromolecules in the plant cell walls, rendering the walls soft and plastic as Cleland suggested (*Ann. NY Acad. Sci.*, **144**, 94; 1967). The mechanism of auxin action has been a major source of controversy in plant physiology for more than forty years and, as these latest reports indicate, the argument shows no signs of dying down.

BIOLOGICAL CONTROL

Protecting Chrysanthemums

from our Botany Correspondent

AN insect predator which was tested successfully as an agent of biological control in the field last year has been used recently in the glasshouse to protect chrysanthemums from aphid pests. The results of trials at the Glasshouse Crops Research Institute are most promising (N. E. A. Scopes, *Ann. Appl. Biol.*, **64**, 433; 1969).

The attempt to use larvae of the insect *Chrysopa carnea* as predators of *Myzus persicae* on chrysanthemums was stimulated by a report that large numbers of the predators released into cages of cotton have considerable potential as a means of controlling the population of the pest *Heliothis*. Scopes reasoned that a glasshouse and a cage in the field are two similarly enclosed environments, and so the same predator should flourish and be effective in both.

Larvae of *C. carnea* showed themselves to be predators of *Myzus persicae* by consuming at least 300 aphids each in 15 days when confined with them, together with a lettuce leaf to provide moisture, in a small pill box covered with gauze. In these conditions another aphid, *Aphis gossypii*, a pest of cucumber plants, was also eaten by *C. carnea*, but there was no hope of using the predator for this purpose in the glasshouse, because the leaves of cucumber plants are too hairy for these larvae to move around easily. They have no difficulty, however, in propelling themselves rapidly over the leaves of chrysanthemum plants.

Great predatory potential was revealed when larvae and aphids were confined in aerated polythene bags sealed over potted chrysanthemums. *C. carnea* suppressed populations of the aphid even when predator and prey were in the ratio 1 : 150, although aphids were totally eliminated only when the ratio was 1 : 50. Using a formula developed by S. Bom-bosch, Scopes calculated that a ratio of 1 : 58.7 would

just control the aphid during the lifetime of the larvae. He predicted, however, that because larvae at the third instar stage of development can consume many more aphids than can earlier larval stages, a ratio of one predator to 200 aphids in this case would still achieve control. This figure was confirmed on chrysanthemums, and larvae of *C. carnea* even markedly suppressed the aphids when outnumbered by 300 to one.

Having shown that it is possible to predict the extent of control of *Myzus persicae* by *C. carnea* in a polythene bag, Scopes let the predators loose in the glasshouse. He found that to control the pest this time he needed a rather larger proportion of predators than the theoretical 1 : 58.7. Control in the glasshouse apparently requires one predator to less than fifty aphids. There was no control, however, if the density of the aphids was four or fewer per plant, for the predators did not seem to be prepared to search them out.

Larvae of *Chrysopa carnea* thus seem to have a future in the glasshouse for the control of large populations of *Myzus persicae*. After numbers have diminished under the scourge of this predator the parasite *Aphidius matricariae* could be brought in to control the smaller population of the pest.

ENTOMOLOGY

New Mite

A NEW species of mite has been found in Greece. It is called *Cenopalpus eriobotryi*, and has been described by Dr E. N. Hatzinikolis in *Annales de l'Institut Phytopathologique Benaki* (NS, **9**, 57; 1969). All stages of the mite, except the adult male, were found on the leaves of loquat trees (*Eriobotrya japonica*) in Attica. The drawing shows an adult female, which is 356 µm long.