"woolly bear" or "carpet beetle"), attack stored clothing, soft furnishings, lagging and similar snug environments—even nests and dead birds in roof spaces —and, although the authorities assure householders that there is no threat to public health, the infestation causes damage and nuisance. Pyrethrum sprays and DDT are reasonably effective pesticides, but eradication is chiefly dependent on the vigour with which spring-cleaning and blanket shaking is pursued. The prevalence of the pest seems, moreover, to be related to the internal and external climate, for the worst effects have been evident after warm summers and in homes with central heating.

TUMOUR VIROLOGY

Getting Crowded

from our Cell Biology Correspondent

THE contents lists of volumes of the *Proceedings of the US National Academy of Sciences* are an accurate index of the changing fashions in biological research. In the nineteen-sixties molecular biology of bacteria and their phages must have accounted for about half of the material published; to judge from the latest number the seventies will see the rise of tumour virology. Already the number of tumour virologists far outstrips the number of new ideas, which means, of course, that all the obvious experiments are being carried out simultaneously in half a dozen laboratories.

For example, it has been known since 1965 that polyoma virus causes resting cells to renew DNA synthesis, but although essentially the whole of the cell's DNA is replicated the cells do not go into mitosis unless they are transformed. During the normal mitotic cycle DNA synthesis is accompanied by synthesis of histones; is this the case when cell DNA synthesis is stimulated by polyoma virus? Earlier this year Shimono and Kaplan (*Virology*, **37**, 690; 1969) reported that infection of mouse kidney cells in culture with polyoma virus resulted in both DNA and histone synthesis, and furthermore that the degree of stimulation of the two processes was correlated. Winocour, in a footnote to a review (*Adv. Virus Research*, **14**, 200; 1969), made the same assertion and now Hancock and Weil (*Proc. US Nat. Acad. Sci.*, **63**, 1144; 1969) have confirmed the point thoroughly yet again. About thirty hours after infection with polyoma virus the chromatin from primary mouse kidney cell cultures contains about 50 per cent more DNA than the chromatin of mock infected controls. The chromatin from the infected cells also contains about 50 per cent more histone and non-histone protein. Infection with polyoma virus apparently activates the regulatory system in host cells which controls the initiation of chromosome replication and not simply DNA replication.

Another widely pursued topic is the nature of the new antigens that appear on cells transformed by polyoma and SV40 virus. Several groups have provided evidence to indicate that the new antigens which appear on the surfaces of cells transformed with the DNA viruses are present on the surfaces of untransformed cells, but are masked in some way that renders them undetectable. The latest report from Sachs's laboratory, for example (Inbar and Sachs, *Proc. US Nat. Acad. Sci.*, **63**, 1418; 1969) indicates that the surface membrane sites on both transformed and abortively transformed mouse cells which bind concanavalin A can be found on normal cells after treatment with trypsin. Stable and abortive transformation seems to result in some identical change in the cell surface.

Another popular idea is that viral transformation results in changes in the composition of cell membranes, although with membrane chemistry in its present messy state searching for the significant putative changes is not much different from searching for needles in haystacks. Mora, Brady, Bradley and MacFarland (*Proc. US Nat. Acad. Sci.*, **63**, 1290; 1969), however, claimed recently that in mouse cell lines transformed with SV40 virus the cell membranes contain reduced amounts of certain higher ganglioside glycolipids compared with the membranes, not only of normal cells, but also of spontaneously transformed cell lines. Mora *et al.* suggest that the presence of the virus genome is required for the change in pattern of gangliosides in the membrane. It remains to be seen whether this result can be repeated and extended to cells transformed with RNA viruses.

AUXIN

Conflicting Evidence

from our Plant Physiology Correspondent

Two recent reports have cast fresh doubt on the currently fashionable theory that auxin promotes and controls the extension growth of plant cells either by derepressing genes or by stimulating the synthesis of messenger RNA. The question of whether or not protein synthesis is involved seems to remain unanswered.

Nelson, Ilan and Reinhold of Jerusalem have studied the effects of two inhibitors of RNA synthesis, and of an inhibitor of protein synthesis, on the growth of sections of stem of sunflower—*Helianthus annuus*—in the presence or absence of the auxin indolyl-3 acetic acid (IAA) (*Israel J. Bot.*, **18**, 129; 1969). The growth of the tissue was inhibited by all the poisons, but, whereas the inhibitors of RNA synthesis, 8-azaguanine and actinomycin *D*, did not significantly affect the rate of auxin-stimulated growth until nearly one hour after application, the effect of the inhibitor of protein synthesis, cycloheximide, could be seen in less than twenty minutes. Nelson *et al.* concluded that, whereas the primary site for the action of auxin cannot be at the level of genetic transcription, it is possible that the hormone stimulates the synthesis of new protein necessary for growth.

This view is not shared by D. Nissl and M. H. Zenk of the new Ruhr University at Bochum, who have adopted a quite different approach (*Planta*, **89**, 323; 1969). If IAA regulates growth by chemical induction of protein synthesis through the transcription and translation of DNA, it is clear that there must be some delay between the addition of the hormone to the system and the first observable signs of growth. Such a time-lag is well known in bacterial systems, where it is known to be independent of the concentration of the inducer. A similar state of affairs would be expected in plants if similar time consuming processes were operating. Nissl and Zenk, however, using a precise optical method to measure changes in the rate of growth, have discovered that the time-lag for the