LETTERS TO THE EDITORS

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A Wilt Disease of the Oil Palm

DURING recent investigations in the Belgian Congo I came across what is apparently a hitherto undescribed wilt disease of the oil palm (*Elaeis guineensis*). Palms of 4–20 years of age have been seen with characteristic necrotic symptoms in the vascular strands of the trunk and roots. The destruction of well-grown palms has been observed in widely separated areas. The lower leaves of such palms show characteristic flagging and wilting; they eventually break near the base of the petiole and hang down in a cluster around the trunk. The younger leaves are successively affected until eventually the whole crown is destroyed and the plant dies (Fig. 1). Wilting may proceed quickly even in the wet season. Affected leaves may show some development of yellow colour, but in many wilting palms there is no abnormal leaf coloration.

The indications are that the vascular system of the trunk becomes infected by way of diseased roots or through wounds in the base of the trunk. Vascular strands, which are normally of a pale yellow colour, turn a greyish-brown to black colour as a result of infection (Fig. 2). The infection is at first most strongly developed in the more peripheral strands of the trunk, but later the central strands also become discoloured; many irregular distributions of discoloured strands have also been observed. The infection eventually spreads upwards in the trunk and even into the crown of the plant, where very marked vascular symptoms may sometimes be observed. Discoloured vascular strands have also been observed in the bases of the crown leaves.

The presence of fungal filaments in necrosed wood vessels was ascertained in microscopic preparations. The same species of *Fusarium* has been isolated on a number of occasions from different localities. Needless to say, this aspect requires much amplification, and inoculation experiments will be necessary before a definitive diagnosis can be given. The presence of the pathogen in the wood vessels is attended by an exudation of gum by which the vessels become blocked. Bacteria were not observed in the vessels.

In some respects this disease of the oil palm closely resembles the wilt disease of bananas (caused by *Fusarium oxysporum cubense*); in others, it presents many new and puzzling features. In some areas the disease, which is also present in natural palmeries, has already taken a considerable toll of plantations either in a direct or accessory capacity. From these brief observations it will be evident that this disease should be studied in all its aspects as soon as possible in the general interest.

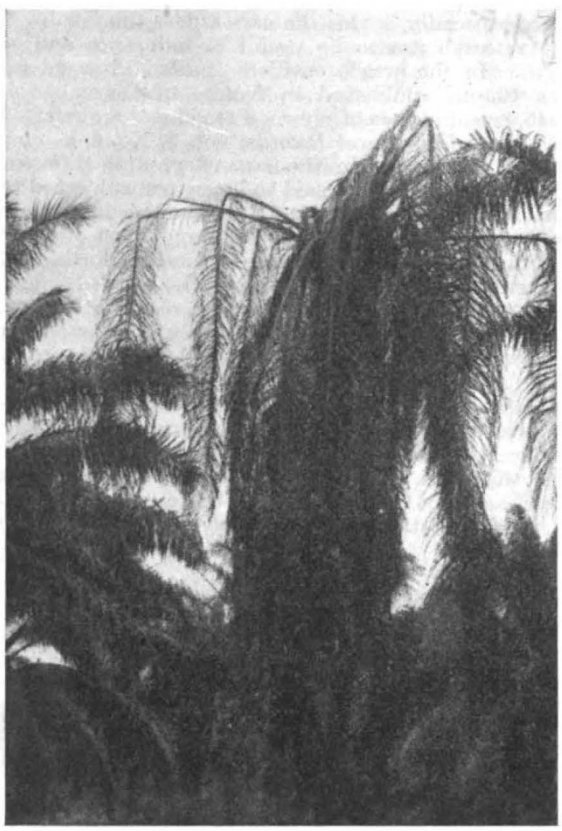

Fig. 1

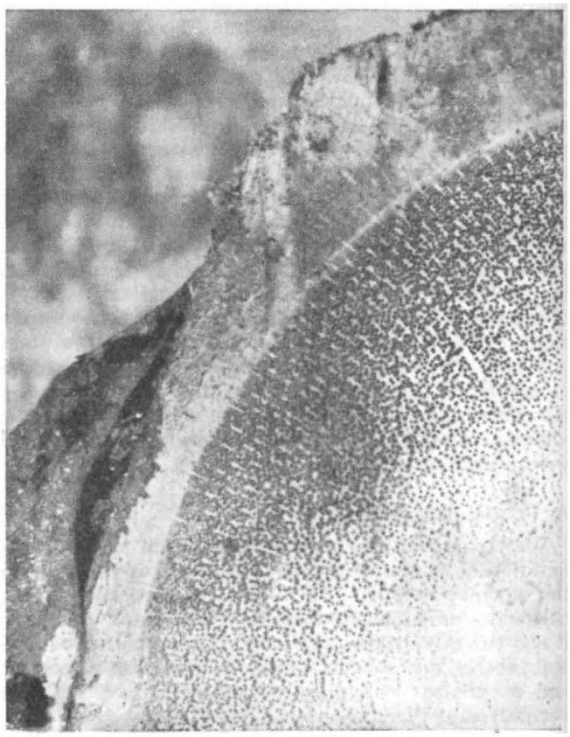

Fig. 2

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Plant Tumours Induced by the Combined Action of Wounds and Virus

IN an earlier paper[1] various symptoms of wound-tumour disease, such as stunting, vein enlargement, leaf distortion and tumours, were described on several of the numerous hosts of the causal virus *Aureogenus magnivena* Black[2]. The present communication deals principally with the role of wounds in tumour inception in diseased plants. Fig. 1 illustrates the kind and number of tumours present on the roots of infected sweet clover (*Melilotus alba* Desr.). A cross-section through a root bearing a tumour (Fig. 2) shows the practically normal portion of the root enclosed within the black line. In this area the parts are, for the most part, regularly arranged. The rest of the section is tumour tissue. It shows several centres of growth, the margins of which are marked by deeply stained meristematic cells with prominent nuclei. The meristematic cells are surrounded by a layer of crushed cells and enclose parenchyma and vascular elements. The xylem is prominent and reveals the highly disorganised condition of the tumour tissue. It may be arranged in whorls or it may be so disorganised that two adjacent xylem elements are disoriented in regard to each other. Affected cells frequently show spherical bodies that stain intensely with safranin. No organisms have been observed in such sections.

Experiments have confirmed the suggestion advanced earlier[1] that tumours produced in wound-tumour disease arise as a result of wounding plant tissues systemically invaded by the wound-tumour virus. In one experiment insect pins 0·25 mm. in diameter were used to make single punctures at the mid-internodal points on stems of systemically infected sweet clover plants (white melilot) (*Melilotus alba* Desr.) and corresponding healthy plants; 175 tumours developed from 387 punctures on infected stems, whereas no tumours developed from 505 control wounds on healthy stems. The younger the tissue injured the greater the proportion of wounds from which tumours developed. Tumours began to be visible to the naked eye as early as seven days after wounding, and most tumours became visible during the second and third week after wounding. By the end of the fifth week, it appeared that if a tumour had not developed at the site of a wound, there was little chance that it would develop there afterwards. A single pin puncture in a terminal node of a diseased plant gave rise to several tumours scattered along the stem.

The locations of naturally occurring tumours on infected plants also suggest the important part played by wounds. 146 very young