stopped the unit adapted slowly to the tonic frequency corresponding to the positional angle reached. The dynamic phase has a duration of about 25 sec. If the wings were moved downwards passively the unit stopped firing. In a flying locust the response consists of from one to five firings towards the end of the upstroke.

Histological work on the nerve indicates that the small spikes originate from the scolopoforous sensilla. They are most active at low positional angles and throughout the downstroke. At least some of the units are tonic both in meso- and meta-thorax. The frequency of discharge increases with decreasing positional angle. Passive downward movement of the wing causes tonic units to fire at higher frequency (200–300 per sec.). They adapt slowly to a frequency determined by the final wing position.

If the sense organs are destroyed by local cauterization the stroke-frequency of a flying locust drops considerably, in some cases to less than half the normal frequency. It seems, therefore, highly probable that at least the stretch receptors are part of a peripheral feed-back system which modifies the frequency of the flight rhythm inherent in the central nervous system[1]. Whether the detailed response from the scolopoforous organs is concerned in the frequency setting or not is uncertain at the moment. There is some indication that the input from the proprioceptors is necessary for the maintenance of flight in response to 'wind on moving wings'[9] because decerebrate locusts can be started but are not able to maintain flight in a wind after the sense organs have been destroyed.

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The Palm Weevil, *Rhynchophorus palmarum* L., a Probable Vector of Red Ring Disease of Coconuts

Several authors[1-7] have made reference to the probable role of insect vectors in the dissemination of the nematode, *Radinaphelenchus cocophilus* (Cobb), the causative organism of red ring disease of coconuts. The results of recent investigations support the view that the palm weevil, *Rhynchophorus palmarum* L., probably plays an important part in the spread of the disease on coconut plantations[1-3,5,6].

The examination of palms between the ages of 1½–2 years and 14–15 years has revealed a high correlation between the incidence of red ring disease and palm weevil infestation (Table 1).

It has also been established that adult palm weevils collected on coconut plantations carry large numbers

Table 1. Correlation between Red Ring Disease Infection and Palm Weevil Infestation

Total No. of palms examined	No. of palms showing: Red ring disease infection and palm weevil infestation	Red ring disease infection only	Palm weevil infestation only
157	149 (95%)	4 (2·5%)	4 (2·5%)

Table 2. Recovery of *R. cocophilus* from Field-collected Palm Weevils

Total No. of weevils examined	Total No. of weevils carrying nematodes	Average No. of nematodes carried/weevil	Total No. of weevils carrying living nematodes	Average No. of nematodes alive/weevil
213	96 (45%)	136	82 (38·5%)	71

of *R. cocophilus* (Table 2). The nematodes are carried both externally in fragments of infected tissue adhering to the body surface of the insect in which they can remain alive for 2–3 days and internally in the digestive tract where they can survive for as long as 10 days.

Examination of the excrement of weevils fed on diseased tissue has further shown that *R. cocophilus* can pass through the gut in an apparently healthy condition. The number of living nematodes recovered from the fæces of weevils is largely dependent on the density and state of activity of the worms in the tissue fed and on the feeding history of the weevils.

Successful transmission of the disease by adult palm weevils has also been demonstrated. The insects were allowed to feed in diseased tissue for 18–24 hr. and afterwards confined on the internodal region of the stem of healthy palms for 48–120 hr. Transmission of the nematodes apparently occurs mainly by the deposition of fragments of infected tissue and contaminated fæces at the bases of the petioles of the palm where the worms gain ready access to the soft internal stem tissues. Transmission via the mouthparts of the weevil does not readily occur.

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Resistance to Dieldrin of *Cimex hemipterus* (Fabricius)

The first report of resistance to dieldrin by the tropical bed-bug, *Cimex hemipterus*, in East Africa was that by Smith[1]. In observations made during the course of the Pare-Taveta Malaria Control Scheme, it was reported[2] that the bed-bug population was reduced to very low numbers following the first dieldrin spray (first treatment of 80 mgm. dieldrin/sq. ft. followed by subsequent treatments of 40 mgm./sq.ft. at eight-month intervals), but 14–19 months after this treatment the bed-bugs were present in sufficient numbers to be considered of nuisance value. In a series of laboratory tests it was shown that whereas bed-bugs from an untreated area were all dead after a