

*Opifex* at emergence are remarkably fat. Biochemical analyses by Dr E. Van Handel of this laboratory showed that both males and females emerged with two to three times the amount of lipid found in newly-emerged salt-marsh mosquitoes, *Aedes sollicitans* and *A. taeniorhynchus*. Their stores of sugar and glycogen at emergence, however, were approximately as in these *Aedes*.

Pupae of *Opifex*, 48 to 96 hours old within that stage, contained much more fat even than the newly-emerged adults. This again points to the interest which must attach to nutritional studies of this strange mosquito.

#### DISCUSSION

Kirk (1923) was in the main correct in his descriptions of this mosquito's unusual behaviour, but certain of his interpretations need to be reassessed in the light of our observations and experiments under more controlled and elaborate laboratory circumstances. It must first be noted that, although not given, it is clear that his observations were mostly at colder temperatures than ours. This, of course, greatly affected any development rate he touched upon, whether egg, embryonic, larval, or other. But it was particularly in the events at emergence and mating that our respective observations disagree.

He observed, as we did, that pupae spend a lot of time underwater and are adept at eluding capture when immature. We could not confirm, however, that males used only their anal forceps in capturing pupae. They use their great tarsal claws in the capture, but then hold on to the captive pupa only with the anal forceps. We failed also to observe anything like the male slitting the puparium to help the imago emerge. In all our numerous observations the opening of the puparium along the thoracic crest occurred unaided. The male did, however, quickly insert his abdomen, as observed by Kirk. And, finally, we found no evidence that males singled out female pupae for attention. In all other aspects of emergence and mating our observations conformed or extended Kirk's.

The oviposition habits of *Opifex* were well described by Kirk. His report that eggs are laid under water and can live a long time in or out of water, hatching erratically, has been abundantly corroborated. It is difficult, however, to understand what peculiar observational circumstances led him to believe that larvae emerge from the egg tail first. We looked for this assiduously and could find nothing but normal mosquito eclosion.

In the matter of precocious sexual behaviour we find our final failure to corroborate Kirk's observation. He stated that the male "does not commence hunting for pupae immediately on emergence from the puparium, but may do so within ten minutes, and usually does so within twenty". We found that males did not hunt pupae until 6-8 hours old, and then only half-heartedly. Continuous hunting occurred only in males 24 hours of age or older. Minimum age at copulation was 6 hours, and age at first copulation was seldom under 12 hours. As in other mosquito species, sexual maturity is established by adequate hardening of the cuticle on which is superimposed rotation of the terminalia. The latter process is, however, faster in *Opifex* than in any other species we have studied. The *Opifex* male is certainly precocious, but not to the extent implied in Kirk's report.