I have not seen the puparium of *D. montium.* The puparium of *D. hydei* is paler and distinctly more slender than that of *D. mercatorum.* These last two species have about 15-16 tubes in the anterior spiracles.

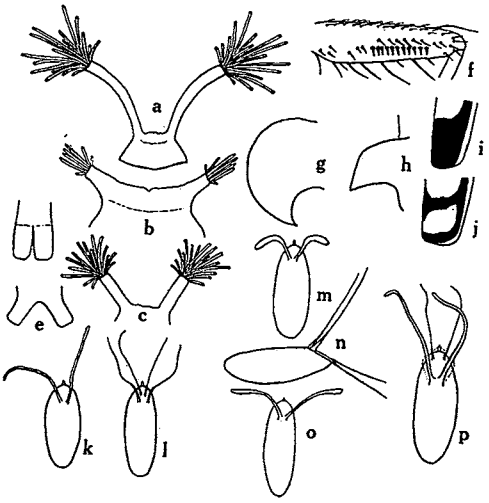

Fig. 1.—Diagrams of features of immigrant species of *Drosophila: a,* "horns" and anterior spiracles of *D. spinofemora; b,* the same of *D. simulans; c,* the same of *D. mercatorum; d,* posterior spiracles of *D. hydei; e,* the same of *D. mercatorum; f,* fore femora of *D. spinofemora; g,* process on male genital arch of *D. simulans; h,* the same of *D. melanogaster; i,* diagram of color pattern on side of an abdominal tergite of *D. hydei* (the middle area of the dark zone may be somewhat paler than the marginal zones—the intensity of the pigmentation is variable); *j,* the same of *D. mercatorum* (the contrast is exaggerated here; some specimens have the dark markings indistinct and have a pale and "washed out" appearance as compared to *D. hydei*); *k,* egg of *D. ananassae; l,* egg of *D. mercatorum; m,* egg of *D. melanogaster; n,* egg of *D. hydei; o,* egg of *D. simulans; p,* egg of *D. spinofemora.*

On the Establishment of the Order Trichoptera in Hawaii

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(Presented at the meeting of December 14, 1942)

Immigrant species new to our fauna are continually being found, but it is rare that a representative of an *order* hitherto unrepresented in Hawaii is recorded. In October, 1940, I collected a series

of a minute, moth-like insect flying about at noon day near the banks of a small garden stream and nervously running about on the bare ground and searching into cracks in the soil at Moanalua Gardens, Honolulu. These specimens appeared to belong to a species of small tineoid moth, but upon examination they were found to represent a species of *Oxyethira*—an almost cosmopolitan genus of the trichopterous family Hydroptilidae. The species is evidently not American, and it is unknown to Nathan Banks, who kindly examined it. Because of the war, it has not been possible to send the material to the British Museum for study and comparison with described species. This is the first record of a caddice-fly from the Hawaiian islands.

The larvae of some species of the family are known to feed upon slime algae, and they provide themselves with small gelatinous cases. We can expect to find our species breeding in such places as lily ponds, taro patches and streams; its larvae have not yet been searched for.

It is probable that this species of *Oxyethira* has gained entrance to Hawaii by accompanying imported aquatic plants (which are abundantly represented in Moanalua Gardens and elsewhere in Hawaii). Aquatic plants have, over a long period of years, been imported from many localities, including Japan and Europe. A number of immigrant aquatic insects—some of them pests—have become established in Hawaii, but it is unusual that more species have not been imported with aquatic plants. Such an obscure species as this tiny micro-caddice-fly could easily have escaped detection for a long time, and there is now probably no way of telling how many years it has been present in our Territory.

One of the striking features of these oceanic islands is the poverty of their fresh water insect fauna. We have an insignificant native representation of aquatic Heteroptera and Coleoptera, and a better developed, yet generically impoverished, Odonata fauna. However, the typical aquatic orders Plecoptera (stone-flies), Ephemerida (may-flies), Megaloptera (dobson-flies) and Trichoptera (caddice-flies) are not present in our endemic fauna. Moreover, these orders are not or are poorly represented on other mid-Pacific islands. The discovery of an immigrant caddice-fly raises the number of orders of insects now present in Hawaii to 26. The only orders not represented either by native, immigrant or introduced species are the Grylloblattodea, Diploglossata, Plecoptera, Ephemerida, Megaloptera, Rhaphidiodea and Mecoptera. Of these, the aquatic Plecoptera, Ephemerida and Megaloptera might become established at some future date. In fact, some species of these orders might be introduced to serve as food for imported fresh water fish. The Grylloblattodea live only in mountainous, snow field country of northwestern America and Japan, and conditions favorable for their establishment in Hawaii do not exist. The Diploglossata are

represented by only two known species which are ectoparasites on certain African rats. The Rhaphidiodea (snake-flies) are mostly Holarctic and are found in America and Eurasia. Some species might possibly become established in Hawaii. The widespread order Mecoptera (scorpion-flies) might include some species which could establish themselves in the Territory if given a good chance. The order Trichoptera is represented by a few native species in Samoa, by a good number in Fiji, and from there westward through the continental islands the order is abundantly represented.

The following characters will make possible the recognition of this small addition to our list of immigrant insects: it greatly resembles a small tineoid moth, but without a proboscis and with hairs instead of scales; palpi long, conspicuous, pendant, segments distinct, maxillary pair five-segmented, labial pair three-segmented; body densely hairy; hairs on posterior edges of the wings longer than the breadth of the slender, elongate-lanceolate wings; numerous hairs on the dorsum of each wing erect and giving a rough and shaggy appearance; hairs on the head arranged in great bristly tufts; ground color of wings iridescent white, but marked with some fuscous areas; wing-spread about 5 mm.

Records of Immigrant Insects for the Year 1942

BY THE EDITOR

In this issue of the Proceedings, the following immigrant species are recorded for Hawaii. Those marked with an asterisk were observed for the first time, at the date mentioned, in 1942. The others were previously observed, or known, but not yet identified. For details of records, etc., refer in the text to the pages as given.