

ART. XXI.—*Eristalis tenax* and *Musca vomitoria* in New Zealand.

By G. V. HUDSON, F.E.S.

[Read before the Wellington Philosophical Society, 2nd October, 1889.]

I. ERISTALIS TENAX.

EARLY last spring (1888) I observed a large dipterous insect in the Botanical Gardens here, which I had not seen before in New Zealand, but soon recognised it as the common drone-fly of England (*E. tenax*). This species is especially interesting as it exhibits such a close superficial resemblance to the hive-bee (*Apis mellifica*) that any one but an entomologist would experience considerable difficulty in separating the two insects, although, of course, structurally they are totally different, belonging as they do to two entirely distinct orders of *Insecta*, the *Diptera* and the *Hymenoptera*.

The resemblance in this case is, in fact, a very perfect instance of "mimicry," the harmless dipteran having assumed the external appearance of the formidable hymenopteron, and thus become shielded from many enemies. That this acquired resemblance has effectually aided the insect in its past career can be immediately seen from its great abundance, and almost universal distribution throughout the world.

The favourable influence of civilisation on this insect must not, however, be overlooked, as the formation of ditches, cess-pits, &c., incidental to the arrival of man has afforded its larvæ numerous breeding-places which formerly did not exist, whilst the propagation of the hive-bee has also no doubt indirectly assisted in increasing its numbers by maintaining that dread among the insectivorous animals which the appearance of a bee is usually sufficient to inspire, and thus to a large extent preserving it from being eaten or otherwise destroyed.

During last April I counted upwards of thirty drone-flies on a small patch of marigolds, and noticed large numbers on the hills between Karori and Wadestown, so that it is evidently increasing here quite as rapidly as elsewhere. It will consequently be interesting in the future to observe the influence that *Eristalis tenax* exerts on its aboriginal relatives, such as *E. cingulatus*, *Helophilus trilineatus*, *ineptus*, &c., as, judging from the behaviour of other northern importations, it should largely supersede them, especially when we consider how efficiently it is protected by its resemblance to a common and powerfully-armed insect. The ultimate extinction of the indigenous species of *Eristalis* and *Helophilus* by this mimetic species would consequently seem not improbable.

It might perhaps be well to mention here that the universal superiority which the northern animals exhibit when competing with the natives of southern latitudes in the struggle for existence is attributed by Darwin to the severe competition which has so long existed amongst the organisms in the northern hemisphere, chiefly owing to the great extent of the land in those regions compared with isolated areas such as New Zealand and other oceanic islands. It is needless to say that we see the words of that great naturalist verified daily, as both the native plants and animals are constantly being supplanted by northern forms.

## 2. MUSCA VOMITORIA.

During last June (1889) I observed on my sitting-room window a specimen of this familiar European insect. Formerly I have often been astonished at its absence from New Zealand, seeing that the ubiquitous *Musca domestica* so long ago obtained a footing, and is now so exceedingly common everywhere. It is consequently somewhat strange that this almost equally abundant species has until so very recently been unable to procure a passage. However, now that it has arrived, the process of naturalisation appears to be progressing rapidly, as I have seen upwards of five specimens during September in various localities, including three in the Botanical Gardens. In habits and appearance this insect closely resembles the larger of our native species of flesh-flies, but may be easily recognised by its pale-blue abdomen striped with black. It will no doubt increase enormously in numbers, and perhaps largely, if not completely, supplant the New Zealand flies. As all these insects have many generations in one summer, the process of competition between the several species should not be a difficult matter to observe.

For those desirous of knowing the economic influence these two new dipterons are likely to exert in New Zealand, it may be satisfactory for them to hear that *Eristalis tenax* is quite harmless in all its stages, the larvæ feeding on the putrid mud at the bottoms of ditches, where it obtains air by means of a remarkable telescopic tube at its posterior extremity, capable of being adjusted to the exact depth at which it happens to be situated from the surface. As to *Musca vomitoria*, it is only an additional scavenger who will industriously remove effete animal matter from the surface of the earth, and as such we need not feel at all sorry it has come here, for, although the flesh-flies are no doubt often very inconvenient, the immense sanitary benefits they confer on mankind can hardly be overestimated.