

ART. XXXH.—A Chapter in the History of the Warfare against Insect-pests.

By W. M. MASKELL.

[Read before the Wellington Philosophical Society, 11th July, 1894.]

MEMBERS of this Society will recollect how often I have brought under their notice the procedure of the Americans and other people for fighting the various pests which injure crops or trees; and it may be thought perhaps that enough has been said on the subject. At the risk, however, of being wearisome, I venture again to draw attention to this matter, and to add another chapter to its history. The plans and methods of mechanical treatment which have been so extensively tried in different countries are, of course, still in use, and doubtless they are in many cases quite successful: indeed, I suppose that the culture of the vine and the orange would be exceedingly difficult and precarious unless these methods were actively pursued. The New Zealand cultivator, as a rule, does not care to attempt anything systematic or properly organized, except, indeed, that every now and then he gets into a terrible fright and scare, and runs wildly to the Government praying for drastic and repressive legislation, which, if he obtained it, would probably be useless. Elsewhere, especially in America, they manage differently, and combination and co-operation are frequently successful, while in this country the disorganized efforts of a few individuals are mostly futile. But in any case it seems to be rapidly becoming understood that, whatever may be the value of mechanical methods against pests, the best process to be adopted is the introduction of the "natural enemy," and its very careful culture and propagation when once introduced. I will not now inflict again on the Society the well-worn history of *Vedalia* and *Icerya*. Everybody here, I presume, knows that pretty well. But the last chapter of that history laid before the members ended with the second journey of Mr. Koebele to Australia, and his introduction from thence into California of several parasitic insects designed to destroy various other scale-blighters in that country: a procedure which, as I am given to understand, has been so far successful already as to have helped greatly the eradication of such pests as *Lecanium oleæ* and *Mytilaspis pomorum*.

Later on Mr. Koebele was engaged by the people of the Sandwich Islands to undertake a similar work for them. These islands are excellently adapted for the cultivation of oranges, lemons, and other fruit, and a large trade could be

carried on in them if the insect-pests were kept down—as also in coffee, which is now largely planted there. Already, before Mr. Koebele's engagement, the planters had been troubled with *Icerya purchasi*, and I may pause here a moment to give you what may perhaps seem an even startling statement. In the year 1891, I think, Mr. Jaeger, a resident of Honolulu, wrote to me saying that *Icerya* was rapidly increasing there, and asking me to procure for him some *Vedalia* to eat it. Although I could not myself supply him, I was able to put him in the way of getting these useful beetles, and in a few months he introduced them to Honolulu. By that time, however, *Icerya* had enormously increased there, so much so that, in a letter received by me only a week or two ago, I find this statement: "*Icerya* became so numerous that it was not safe to walk in the streets, as they became so slippery; and near a large burying-ground, where the 'monkey-pot trees' were full of the scale, on the side where the wind blew towards some houses the people had to leave the houses because they became so full of the young insects that it was impossible to sleep." After the introduction of *Vedalia*, Mr. Jaeger says, in six months a clean sweep was made of *Icerya*, the ladybirds increasing in such numbers that in places they could be swept up in heaps; and now the Sandwich Islands have no more to fear from *Icerya*.

Encouraged by this success, the people of Hawaii thought they might extend their efforts, and they engaged Mr. Koebele to give them his time and energies with this object. Going to Honolulu in 1892, he sent down to me several scale-insects for identification and description; and I was able to put him on the track of some useful parasites by acquainting him with the native country of some of these pests and their relationships and life-histories, for particulars of this kind are great helps in that direction. Some of the scales in question were described or mentioned by me in my paper of 1892 (*Transactions*, vol. xxv.), and others will be included in my paper for the volume of 1894. Amongst them are two especially injurious ones, which I have named respectively *Pulvinaria psidii* (on guava and coffee) and *Dactylopius vastator* (on orange and a great many other trees). Both of these are probably importations to Honolulu from Japan in the last five years. Regarding the first, Mr. Koebele, who is at present in Australia, writes to me that it "attacks the coffee, and bad at that; and for miles away you could see the presence of the scales by the black appearance of the guava forests." As to the second, he says, "I have seen no Coccid that is so destructive to trees as this species." But he goes on to say, "I have already introduced two of the ladybirds which prey on *Pulvinaria psidii*, and think that in a couple of years it will be rare in Hawaii;

and, as for *Dactylopius vastator*, I trust the danger is over, as we have already sent several colonies of its enemies."

When the late Agricultural Conference was sitting here I endeavoured to bring this question of scale parasites before it, and I understand that a resolution was again passed asking the Government to appoint "an entomologist." In Auckland lately a similar conference passed a similar resolution; but there they went further, and suggested that a certain gentleman should be so appointed. I have not the least desire to make any ungracious remarks, nor have I a word to say against that gentleman as an entomologist, but it is my duty to repeat what I said three or four years ago in my memorandum to the Minister of Lands: there is not in New Zealand an entomologist of the kind required for this purpose. Either the thing is worth doing properly or it is not worth doing at all. The Hawaiian people think it worth their while, and they import a trained expert. Their example should be a lesson for New Zealand.

I regret very much to inform the Society that the leading economic entomologist of the world, Dr. C. V. Riley, of Washington, has lately been obliged, from ill-health and other causes, to resign the position of head of the United States Agricultural Department in that branch. Dr. Riley is one of the honorary members of the New Zealand Institute. Farmers and cultivators of every kind in every country of the globe owe him a great debt of gratitude for what he has done for them in the last thirty years, and I am sure that this Society, although not personally acquainted with him, will join with me in feeling deep regret that the official services of so ardent a friend to all agriculturists should for the future be lost to the world.

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ART. XXXIII.—*On the Anatomy of Flight of certain Birds.*

By Sir JAMES HECTOR, F.R.S.

[Read before the Wellington Philosophical Society, 25th July, 1894.]

THE mechanism of the flight of birds is an attractive subject, and its various modifications afford some of the strongest arguments in favour of the views of those who hold that the structure of animals is wonderfully plastic. It is beyond doubt that the outward form and even the internal structure of birds changes readily under the constraint of changing environment and function, as, for instance, in domestic poultry. I have recently made two observations which may be worthy of record, as throwing further light on this subject.