

sarily follows that the dipterous beak is also a labium, but the question of the dipterous mouth is obviously re-opened, and Dr. Smith's homologies must be most carefully tested. The mandibular seta is a puzzle, but if we homologize the two pairs of jaws there is no reason why it should not be called a mandibular lacinia.

—Dr. Riley presented a paper of which the following is an abstract :

**NOTES FROM CALIFORNIA: RESULTS OF MR. KOEBELE'S
SECOND MISSION TO AUSTRALIA.**

By C. V. RILEY.

[*Author's abstract.*]

Dr. Riley, under this head, gave an account of his observations upon his recent trip to California as to the results of Mr. Koebele's second mission to Australia. He briefly narrated the history of this mission as recorded in official publications of the Department of Agriculture, and to the unpleasant controversy between the California State Board of Horticulture and the Department which had grown out of this mission. Said State Board had obtained an appropriation from the State legislature for the importation of beneficial insects and had appealed to the Secretary of Agriculture to have Mr. Koebele sent over to Australia for this purpose, the appropriation being placed at the service of the Department. The then Secretary, Hon. J. M. Rusk, being absent, Acting Secretary Edwin Willets courteously declined, for reasons, the proposed arrangement. Upon his return, however, Secretary Rusk, having in the meantime, while in California, promised that Mr. Koebele should be sent, reversed Mr. Willets' decision. Mr. Koebele was consequently sent under Dr. Riley's direction. As time went on, the results of the introduction through Mr. Koebele's efforts, as a consequence of this second mission, caused much discussion in California, the State Board and its adherents claiming great success, while the practical fruit-growers as a rule began to lose faith. Dr. Riley alluded to several incidents which showed the baneful effects which political influence and methods sometimes have on scientific investigation. In the fall of 1893 he had Messrs. Coquillett and Koebele directed to carefully examine and report on the condition of the importations and the work they were doing. Their reports were published in *Insect Life*, Vol. VI, pp. 24-29, and showed on the whole that the imported insects had, up to that time, failed to produce any marked beneficial

results. There were exceptional instances, and one particularly, at Santa Barbara, where *Rhizobius ventralis* was reported to be doing much good in clearing olive trees of the Black Scale, *Lecanium oleæ*.

The controversy as to what these insects were doing continued, however, and he made it a point in his recent trip to study as far as possible the actual state of things. For this purpose he had made observations around Sacramento, San Francisco, Los Angeles, and in various parts of Orange and of Santa Clara counties, as well as in and around Santa Barbara. At Los Angeles he examined with special interest the Kercheval orchard, where *Orcus chalybeus* had been extensively colonized and cared for with much assiduity. He found there that the original trees upon which the ladybirds had been colonized still contained many specimens of the Red Scale, *Aspidiotus aurantii*, which it was expected to exterminate, while the orchard, as a whole, was in a sorry plight both from the scale and from neglect. A few specimens of the ladybird were found after considerable search. In several orchards around Santa Barbara which were very carefully examined he found but very little evidence of the work of *Rhizobius*, and none of any of the other introduced species. The same was true at Redlands, Riverside, Pasadena, Altadena, and other places where he had been able to make careful examinations.

All over California the Black Scale is present this winter in smaller numbers than usual. This is the case in localities where *Rhizobius* has not been introduced, as well as in localities where it has been introduced, and this is probably the result of the extremely hot, dry summer of last year. Many of the young scales, however, are still alive, even in localities where *Rhizobius* had been colonized. He found a few specimens of *Leis conformis*, but none of the introduced species were present in any locality in anything like the same numbers as the native ladybirds, notably *Chilocorus bivulnerus*.

Dr. Riley called attention to the fact that in Europe and America our predaceous insects have, as a rule, some property that protects them from the attacks of other animals. In the case of the Coccinellids this protection is believed to be due to some acrid secretion unpalatable to predaceous animals and other predaceous and parasitic insects. The Australian Coccinellids, however, seem to be of a lower type and not to share in such immunity. They are known in the larva state to be quite commonly parasitized, and, what is more singular, are extensively eaten both in the larva and imago states by birds, the English sparrow being conspicuous in this respect, as recorded by French and other Australian writers.

Considering that over 50 species of ladybirds were sent over by Mr. Koebele, it is remarkable that so few of them have held their own in California or multiplied so as to accomplish any good. *Orcus chalybeus* and *O. australasiae*, of which so much was expected by Mr. Koebele and by the State Board of Horticulture, are practically unknown to-day among fruit-growers, and only found in comparatively few numbers where they were introduced. The two species of *Rhizobius* which have maintained themselves show great variation in different localities. As a consequence, the gas treatment is still being vigorously employed by most of the people concerned, and by the county commissioners, and where some insecticides or other preventive means is not adopted, the orange groves are yet suffering from both the Red and the Black Scales. The policy, however, of introducing parasites and predaceous insects from abroad has a very strong hold on the people of the State, but the present condition of things fully justified the position which he had taken, and confirmed the general conclusions in his paper on "Parasitic and Predaceous Insects in Applied Entomology," read at the meeting of the Association of Economic Entomologists at Madison in August, 1893 (*vide* Insect Life, Vol. VI, No. 2, pp. 130-141).

As the speaker had often insisted, he was strongly of the opinion that careful study should always precede any attempt at introducing species for practical purposes. We should satisfy ourselves first as to the country of origin on the introduced injurious form; we should then satisfy ourselves that in that country it is held in check by natural enemies which do not occur in this country. These facts having been ascertained, we may then endeavor to introduce such natural enemies, with some hope of beneficial results, especially if care be taken to introduce them without *their* natural enemies. This favorable situation exists in the case of the Gypsy Moth, and he expressed himself as surprised that the Gypsy Moth Commission had not sent over to Europe for the natural enemies of this insect, as he had himself urged them to, several years ago.

As experience with the last introductions from Australia varied somewhat with locality, he believed it would be advisable, even though the chances might be against important practical results, to introduce the Australian *Rhizobiids* that had maintained themselves in California to the Atlantic coast, since one of them had been found also to feed upon *Aspidiotus perniciosus*, which was just now spreading in the Eastern States. He also believed that good would result by introducing some of the insects of this genus, as well as the two species of *Orcus* just mentioned, to Montserrat, as they might do better there than they do in this country in competition with our indigenous species.