

the various characters which counts". After we have read the chapter, we feel that though the principles have been carefully demonstrated, we are to-day no nearer an accepted and international classification or nomenclature than we were years ago. We would like to have said more about "the marriage between Northern names and Latin terminations", but perhaps the polished language of the author is a better protest against these 'barbarisms' than our more vigorous language would have been.

Chapter ix. deals with variation. In this chapter there is a great deal of new work, much of it based on the researches of the author. The material is of very great importance, and the facts are all well put. The general literature on this subject is very confusing, and we welcome the attempt—and we think the successful attempt—to make it clear. The chapter requires careful and thoughtful reading, but it will well repay the time and labour spent on it.

Taking this volume as a whole, it is the most interesting one yet issued, and, in itself, will give this 'System' a very high place in bacteriological literature.

J. M. BEATTIE.

### Biological Control of the Coconut Moth.

*The Coconut Moth in Fiji: a History of its Control by means of Parasites.* By Dr. J. D. Tothill, assisted by T. H. C. Taylor and R. W. Paine. Published for the Government of Fiji. Pp. vii + 269. (London: The Imperial Bureau of Entomology, 1930.) 31s. 6d. net.

THIS sumptuously produced volume is in reality a detailed account of a single experiment in applied entomology. It is concerned with the biological control of a species of moth the larva of which, in attacking the coconut palms of Fiji, threatened the copra industry of those islands with disaster. The insect in question, *Levuana iridescens*, belongs to the family Zygaenidæ and, so far as is known, is confined to Fiji. Its larvæ, by destroying the foliage of the coconut, converted what were originally waving green fronds into remnants of miserable lifeless grey. Since the insect proved to be free from parasitic enemies, this fact in itself suggested that its original home may be in some land other than Fiji. It also appeared probable that the introduction, under favourable conditions, of some effective insect enemy might go a long way towards solving the problem of its control. The present volume is a record of how this theory was translated into practice.

Since a search among the Pacific islands for *Levuana* in its native home, where it would most likely be subject to attack by parasites, proved fruitless, recourse had to be made to allied coconut pests. Insects of the family Zygaenidæ are rarely destructive, but the species *Artona catoxantha* is known to attack coconuts in Malaysia and Java. It proved, furthermore, to be subject to attack by the Tachinid fly *Ptychomyia remota*. Since *Artona* and *Levuana* are closely related, it appeared probable that a parasite of the former genus would find the *Levuana* an acceptable host. The campaign hinged on this possibility and, after considerable difficulties, the Tachinid fly was eventually introduced into Fiji. The success of the experiment was remarkable: six months after its introduction, the fly had spread throughout the areas of Fiji affected by the *Levuana*, and many of the outbreaks had subsided entirely owing to the destructive effects of this parasite upon the caterpillars of the moth. There has, to-day, been no outbreak of the pest for more than three years, and the copra industry of Fiji has been extricated from an awkward predicament by this fortunate biological experiment.

The history of the campaign is described in detail in this volume: the structure and life-history of the moth are elaborately dealt with and the parasitic *Ptychomyia* is similarly discussed. Allied Zygaenid moths and their natural control also come in for treatment, and there is a wealth of text-figures and beautifully executed coloured and half-tone plates appended. The whole volume thus serves as a detailed permanent record of an experiment of equal importance to those achieved in Hawaii and elsewhere. No similar biological triumph has so far been placed upon record in so complete and elaborate a form. The high price of the volume may militate against its rapid circulation, but all whose business is concerned with pest control will need to add it to their bookshelves. It should prove a valuable propagandist source in that it will focus attention upon the possibilities of biological control—when it is applied intelligently to problems amenable to this method of solution.

A number of entomologists, administrators, and others have played their part in the campaign recorded. To each of these we tender our sincere congratulations upon an achievement that should rank high in the annals of applied entomology. The Imperial Bureau of Entomology, which published the volume on behalf of the Fiji Government, also deserves commendation for the faultless style in which it has been produced.

A. D. IMMS.