



S. 1603

MIMICRY. By G. D. Hale Carpenter, M.B.E., D.M., Hope Professor of Zoology, Oxford. With a Section on its Genetic Aspect by E. B. Ford, M.A., B.Sc., Lecturer in Genetics and University Demonstrator in the Department of Zoology and Comparative Anatomy, Oxford. (Methuen & Co., Ltd., London, 1933; 3/6 net.)

It is a pleasure to welcome the appearance of a small and admirable introduction to this complex and difficult subject, together with the excellent section on its genetic aspect—an aspect which some may think even more complex and difficult than the main subject itself. The authors here successfully overcome the difficulties which render the writing of a small book in some respects so much harder than the writing of a large one—the difficulties of selection; and the little book they have produced is exactly the thing that is wanted.

The intimate experience which Professor Hale Carpenter has enjoyed for so many years in tropical Africa is often brought home to the reader, giving a life and charm which the necessary condensation cannot dispel. All the figures shown on the striking Plate I were reproduced from photographs of specimens captured by him on the Sesse Isles in Lake

Victoria. 'No field naturalist,' he writes, on p. 41, 'forgets the pleasure that comes from being deceived by Mimicry, even after years of experience'; and, among other instances, he 'well remembers one occasion (1918) when, seeing a flying insect, he felt certain that there at last was the model of some mimetic beetles he had previously taken, only to find that this one also was a beetle!' Of special interest and importance for the theory of Mimicry is the account of the behaviour of monkeys, which, although perfectly tame and on the most friendly terms with the writer, were obviously displaying their natural preferences and dislikes, sometimes while hunting for themselves in the open. These observations may be compared with those of Dr. and Mrs. J. G. Myers upon the behaviour of a South American carnivor, the Coati, which was 'given complete liberty in the field, since it would always follow us. On such occasions it hunted assiduously on its own account, and was occasionally given insects we had caught.' Both these insect-eaters rejected the species with conspicuous warning colours such as are mimicked by others, and devoured those which harmonise with their natural surroundings.

I desire again to emphasise the great value of this little book which meets a long-felt want, and, as I have no doubt that a new edition will soon be called for, the remainder of this review will be devoted to suggestions for brief additions which might be made here and there, and to one or two corrections of small points.

Although it is likely that the 'Clear-wing' moths, represented by many British species, are Batesian mimics of wasps or hornets (p. 23), the mimetic clear-winged species of the Syntomidae are probably Müllerian, as the author recognises in the explanation of Plate I, where, however, '12. *Syrphidae Bacha*, sp.' should be '11,' and a comma should follow *Syrphidae*.

The remarkable mimetic association between two Western Chinese butterflies and a more Southern model (p. 43) becomes still more surprising when it is realised that all three patterns are those of the males. The six words which conclude para. 19 on p. 55 would read better by a slight transposition—'two bees which it did not resemble.'

The author considers (p. 64) that the 'devouring [of the excreta of the young by certain birds] is surely not for the purposes of food, but of sanitation.' It has always seemed to the reviewer that the digestion of the young may still leave a remnant valuable to the parent during this period of stress. Many birds, of course, are solely concerned with sanitation, carrying the excreta away and dropping them at some distance from the nest.

In mentioning the wonderful South American *Protogonius*, with its dead-leaf-like under- and conspicuous, mimetic upper-surface (p. 26), some reference to W. J. Kaye's discovery that the latter alone is seen from below when the butterfly is floating overhead, would seem to be appropriate, and

all the more so because the observation pointed the way to many other examples of a striking adaptation which had been overlooked. In these, as in *Protogonius*, the colours of parts of the under-surface pattern which appear opaque when the butterfly is resting, are shown to be almost transparent when seen against the sky or a strong light. The resemblances to dead leaves described on p. 85 would be improved by a few lines on the seasonal differences of form which have arisen independently in butterflies of different groups. The argument on the following page might also include brief reference to another method by which the danger of intensely specialized protective resemblance may be averted—*viz.*, by restriction to extremely rare species.

Two small points in Part III might be modified with advantage. Although the argument founded on the *dionysos* female of *Papilio dardanus* (p. 113) is valid, the statement that it 'resembles no other species' is not strictly correct, for the pattern does resemble that of an extremely rare Danaine butterfly, *Amauris fenestrata*, from the French Congo, which may have acted as the model in times past but is not found in collections including *dionysos* from various localities along the West Coast. It would also be better to describe the female of the Silver-washed Fritillary as *more* male-like than the dark form *valezina*, rather than as simply male-like, for the patterns of the sexes are really quite distinct.

E.B.P.

