

CONVERGENCE IN EVOLUTION

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Convergence in Evolution by Arthur Willey

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FIG. 7 (see p. 90). HEAD OF INDIAN MUNGOOSE (*Herpestes smithii*), showing horizontal pupil.

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WITH ILLUSTRATIONS

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1911

DEDICATION

TO SIR E. RAY LANKESTER, K.C.B., LL.D., F.R.S.

DEAR SIR RAY,

Twenty years have elapsed since I published my first preliminary note under your guidance, and sixteen since I endeavoured to make a scanty return by dedicating a volume to you.

If there was a reason then, there must be a two-fold reason now for associating your name with a book of this nature, the one to balance the other.

To you, with your intimate and apostolic knowledge of the situation, and mastery of the facts which govern it, it may seem rash to attempt anything like a revision of first principles; but having regard to the actual state of zoological speculation, yesterday or to-day, it is clear that much remains to be done before the ground can be freed from many of the qualities which favour the growth of error.

Yours sincerely,

A. WILLEY.

22 Jan. 12. R.B.R.

ms. no. of 6.10.38

PREFACE

IN these pages I have attempted to place on record in a connected form some facts of natural history which have, directly or indirectly, passed under my own observation during a number of years, together with others which I have collected from various sources. Many of them are known facts brought into fresh conjunctions, others are somewhat less familiar, and some are practically new. I have endeavoured to render the language intelligible to those who have an inkling of biological knowledge; and terms which may appear difficult in the text are usually explained in the context; but I have found it impossible to avoid using the current phraseology of the subject.

Morphology as comprehending the analysis of organic form is distinguished from art which concerns itself with the portrayal of form; and it appeals to a much more limited circle, its applications being obscure and, as a general rule, of interest only to specialists. Its relation-

ship to art is obvious in many of its aspects, not least so in its bearing towards truth. The flamboyant manner in which Napoleon crosses the Alps on canvas is not farther from the truth than many a morphological theory which has received the last touches of a master hand. Yet the theory and the picture though wrong are presumably good, that is to say, the technique is competent, and the moment selected for interpretation and presentation interesting; and if there is a preference it must be for the picture which makes no pretension to scientific accuracy.

Beyond a certain point morphology becomes an art, and as such its scope is infinite; as an expression of simple truth its horizon is strictly limited, and consequently there have not been wanting those who have depreciated its value, perhaps through forgetfulness of the fact that the complexity of biological questions is rarely realised even by specialists, because the origins of morphological types are rooted in remote and intangible obscurity. It should be added that my remarks refer almost exclusively to the zoological side of morphology, although many of the principles involved apply with equal, if not with greater force to its botanical aspect.

The history of zoological classification since

the time of Linnæus has consisted largely of rectifications in the systematic positions originally assigned to animals which were thought to resemble others in certain superficial traits of their organisation, and hence were classed together, *e.g.*, the Foraminifera and the Nautiloidea, the Cephalopoda and Pteropoda, the Cirripedia, Tunicata and Mollusca. It is only after such groups are relegated to their proper position in the zoological system that the phenomena of convergence begin to appear in their true light with an independent interest of their own. The limitations of convergence coincide with those of homology, and the criteria of the one are inversely those of the other. Its importance in morphology is therefore clear enough, and no apology would be required for the repeated discussion of it, were the treatment adequate.

Up to a certain point the gist of what I have set down in these pages may be regarded as an attempt at a reply to a recent "earthquake hypothesis" concerning the origin of Vertebrates, which has been published in a remarkable volume by a very eminent physiologist, Dr W. H. Gaskell. I can only hope that Dr Gaskell and others will accept it in the spirit in which it is offered. Besides this I have endeavoured to