

TRANSLATIONS
or
FOREIGN BIOLOGICAL MEMOIRS

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ESSAYS UPON HEREDITY

AND KINDRED

BIOLOGICAL PROBLEMS

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AUTHOR'S PREFACE.

THE essays which now appear for the first time in the form of a single volume were not written upon any prearranged plan, but have been published separately at various intervals during the course of the last seven years. Although when writing the earlier essays I was not aware that the others would follow, the whole series is, nevertheless, closely connected together. The questions which each essay seeks to explain have all arisen gradually out of the subjects treated in the first. Reflecting upon the causes which regulate the duration of life in various forms, I was drawn on to the consideration of fresh questions which demanded further research. These considerations and the results of such research form the subject-matter of all the subsequent essays.

I am here making use of the word 'research' in a sense somewhat different from that in which it is generally employed in natural science; for it is commonly supposed to imply the making of new observations. Some of these essays, especially Nos. IV, V, and VI, essentially depend upon new discoveries. But in most of the remaining essays the researches are of a more abstract nature, and consist in bringing forward new points of view, founded upon a variety of well-known facts. I believe, however, that the history of science proves that advance is not only due to the discovery of new facts, but also to their correct interpretation: a true conception of natural processes can only be arrived at in this way. It is chiefly in

this sense that the contents of these essays are to be looked upon as research.

The fact that they contain the record of research made it impossible to introduce any essential alterations in the translation, even in those points about which my opinion has since changed to some extent. I should to-day express some of the points in Essays I, IV, and V, somewhat differently; but had I made such alterations, the relation between the essays as a whole would have been rendered less clear, for each of the earlier ones formed the foundation of that which succeeded it. Even certain errors of interpretation are on this account left uncorrected. Thus, for instance, in Essay IV it is assumed that the two polar bodies expelled by sexual eggs are identical; for at that time there was no reason for doubting that they were physiologically equivalent. The discovery of the numerical law of the polar bodies described in Essay VI, led to what I believe to be a truer knowledge of them. In this way the causes of parthenogenesis, as developed in Essay V, received an important addition in the fact published in Essay VI, that only one polar body is expelled by parthenogenetic eggs. This fact alone explains why sexual eggs cannot as a rule develop without fertilization.

Hence the reader must not take the individual essays as the full and complete expression of my present opinion; but they must rather be looked upon as stages in research, as steps towards a more perfect knowledge.

I must therefore express the hope that the essays may be read in the same order as that in which they appeared, and in which they are arranged in the present volume. The reader will then follow the same road which I traversed in the development of the views here set forth; and even though he may be now and then led away from the direct route, perhaps such deviations may not be without interest.

I should wish to express my warm thanks to Mr. Poulton for the great trouble he has taken in editing the translation, which in many places presented exceptional difficulties. The

greater part of the text I have looked through in proof, and I believe that it well expresses the sense of the original; although naturally I cannot presume to judge concerning the niceties of the English language. I am especially grateful to the three gentlemen who have brought these essays before an English public, because I believe that many English naturalists, even when thoroughly conversant with the German tongue, might possibly misinterpret many points in the original; for the difficulty of the questions treated of greatly increases the difficulty of the language.

If the readers of this book only feel half as much pleasure in its perusal as I experienced in writing it, I shall be more than satisfied.

AUGUST WEISMANN.

FREIBURG I. BREISGAU,
January, 1889.

EDITORS' PREFACE.

THE attention of English biologists and men of science was first called to Professor Weismann's essays by an article entitled 'Death' in 'The Nineteenth Century' for May, 1885, by Mr. A. E. Shipley. Since then the interest in the author's arguments and conclusions has become very general; having been especially increased by Professor Moseley's two articles in 'Nature' (Vol. XXXIII, p. 154, and Vol. XXXIV, p. 629), and by the discussion upon 'The Transmission of Acquired Characters,' introduced by Professor Lankester at the meeting of the British Association at Manchester in 1887,—a discussion in which Professor Weismann himself took part. The deep interest which has everywhere been expressed in a subject which concerns the very foundations of evolution, has encouraged the Editors to hope that a volume containing a collection of all Professor Weismann's essays upon heredity and kindred problems would supply a real want. At the present time, when scientific periodicals contain frequent references to these essays, and when the various issues which have been raised by them are discussed on every occasion at which biologists come together, it is above all things necessary to know exactly what the author himself has said. And there are many signs that discussion has already suffered for want of this knowledge.

A translation of Essays I and II was commenced by Mr. A. E. Shipley during his residence at Freiburg in the winter of 1884. His work was greatly aided by the kind assistance of Dr. van Rees of Amsterdam, to whom we desire to express our most sincere thanks. The translation was laid aside until the summer of 1888, when Mr. Shipley was invited to co-operate

with the other editors in the preparation of the present volume; the Clarendon Press having consented to publish the complete series of essays as one of their Foreign Biological Memoirs.

We think it probable that this work may interest many who are not trained biologists, but who approach the subject from its philosophical or social aspects. Such readers would do well to first study Essays I, II, VII, and VIII, inasmuch as some preparation for the more technical treatment pursued in the other essays will thus be gained.

The notes signed A. W. and dated, were added by the author during the progress of the translation. The notes included in square brackets were added by the Editors; the authorship being indicated by initials in all cases.

In conclusion, it is our pleasant duty to thank those who have kindly helped us by reading the proof-sheets and making valuable suggestions. Our warmest thanks are due to Mrs. Arthur Lyttelton, Mr. W. Hatchett Jackson, Deputy Linacre Professor in the University of Oxford, Mr. J. S. Haldane, and Professor R. Meldola. Important suggestions were also made by Professor E. Ray Lankester, Mr. Francis Galton, and Dr. A. R. Wallace. Professor W. N. Parker also greatly helped us by looking over the proof-sheets with Professor Weismann.

E. B. P.

S. S.

A. E. S.

OXFORD, *February*, 1889.

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Abstracts of Professor Weismann's Essays on Heredity and Kindred Problems, already Published in this Country.

- I. A short abstract in 'Nature,' Vol. XXXVII, pp. 541-542, by P. C. MITCHELL.
 - II. A short abstract in 'Nature,' Vol. XXXVIII, pp. 156-157, by P. C. MITCHELL.
 - III. A short article on the subject of this Essay in 'The Nineteenth Century' for May, 1885, by A. E. SHIPLEY.
 - IV. Abstract in 'Nature,' Vol. XXXIII, pp. 154-157, by Professor MOSELEY.
 - V. Abstract in 'Nature,' Vol. XXXIV, pp. 629-632, by Professor MOSELEY.
 - VI. Abstract in 'Nature,' Vol. XXXVI, pp. 607-609, by Professor WEISMANN.
 - VII, VIII. The Essays being of so recent a date no abstract has yet appeared in this country.
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A criticism of Professor Weismann's theories will be found in 'The Physiology of Plants,' by Professor VINES, Lecture XXIII, pp. 660 et seqq.