

**SEXUAL DIMORPHISM IN THE
ANIMAL KINGDOM, A
THEORY OF THE EVOLUTION OF
SECONDARY SEXUAL
CHARACTERS**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649702862

Sexual Dimorphism in the Animal Kingdom, a Theory of the Evolution of Secondary Sexual Characters by J. T. Cunningham

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

www.triestepublishing.com

J. T. CUNNINGHAM

**SEXUAL DIMORPHISM IN THE
ANIMAL KINGDOM, A
THEORY OF THE EVOLUTION OF
SECONDARY
SEXUAL CHARACTERS**

SEXUAL DIMORPHISM

*ool.
marph.*

SEXUAL DIMORPHISM

IN THE

ANIMAL KINGDOM

A THEORY OF THE EVOLUTION OF SECONDARY
SEXUAL CHARACTERS

BY

J. T. CUNNINGHAM, M.A.

FORMERLY FELLOW OF UNIVERSITY COLLEGE, OXFORD; AUTHOR OF 'MARKETABLE
MARINE FISHES OF THE BRITISH ISLANDS.'

WITH THIRTY-TWO ILLUSTRATIONS

*89852
10/8/08.*

LONDON

ADAM AND CHARLES BLACK

1900

PREFACE

It must be admitted that my discussion of Sexual Dimorphism in this work is incomplete, and this in two senses. In the first place, evidence of the kind I have endeavoured to collect is in many cases wanting, and has yet to be obtained in the future. The absence of such information is partly due to the difficulty of obtaining it, to the want of opportunities, and partly to the neglect of opportunities and to the absence of any special efforts to obtain it. It is not my intention by such an assertion to throw the blame upon collectors and field naturalists. Their methods of work are naturally adapted to the ends they have in view, and so long as the minute study of habits and conditions of life is generally regarded as of little importance, so long will the collection of specimens and the discovery of species be considered the chief objects of a zoological expedition. It is strange that even from the point of view of selection more attention has not been devoted since Darwin's time to the study of the particular functions or utilities of special characters. When we desire to know fully the irritations and stimulations produced on living tissues by the special habits of the animal, and how its special organs or characters are affected when they come into action, it is clear that the detailed study of the habits of the living animal becomes still more important. A zoological

expedition, provided only with notebooks and drawing materials, and strictly forbidden to kill, preserve, or bring home a single specimen, might obtain results of the greatest value to science.

It is surprising that our scientific menageries have not added more to our knowledge in the direction to which I refer. It is true that many interesting and valuable observations have been made, but as the description of the behaviour of a living animal adds so much less to a man's reputation than an anatomical or systematic research, the study of habits makes slow progress.

If the incompleteness of my work in this sense should appear to be a reason for deferring its publication, I would plead a hope that in its present state it may stimulate and suggest investigations, which are not likely to be undertaken until the importance of their object is realised.

But I cannot claim that my book contains all the information that has been recorded, or that I have fully considered that information. The reason of this is that, owing to the pressure of other duties, I was unable to devote more time to it. If I had not published it now as it is, it might never have been published at all—a contingency which, whatever my fellow-zoologists may think, I at least could not accept with equanimity.

Incomplete as it is, the book would have been much more so but for the generous aid of many able friends. Mr. E. W. L. Holt supplied me with valuable material for the Chapter on Fishes, and also assisted by superintending the preparation of some of the illustrations. Mr. Rupert Vallentin allowed me to make use of the unique photographs from the living elephant seal which he took with his own camera in the Falkland Islands. To Dr. Hans Gadow I am deeply indebted

for much information and many suggestions, especially in reference to the Chapters on Mammals and Birds. In fact, without Dr. Gadow's advice and influence the book would probably never have appeared. Dr. A. G. Butler, Mr. G. A. Boulenger, F.R.S., and other members of the Staff did everything in their power to facilitate my work at the Natural History Museum. To these friends, and also to the artists who have supplied the figures, Miss S. A. Willis, Mr. H. Grönvold, and Mr. E. Knight, I have much pleasure in recording my gratitude.

Apart from these contributions the book consists very largely of facts and descriptions taken from zoological literature, and few of the facts are based on my own observations. It is, indeed, for the most part, a compilation, and the only part of it for which the author is specially responsible is the theory, which by many will probably be considered the least valuable part. Such an opinion may be really correct. I would only ask that the theory I have tried to elaborate shall not be condemned and rejected merely because it is in opposition to the views which have the sanction of authority. Mr. Arthur Balfour has maintained, with much ingenuity, that authority is the surest foundation of belief. However it may be in matters theological, history proves that, in matters intellectual, authority is merely an obstacle to progress, and that the only sound foundation for belief is reason. I appeal to reason, and if my arguments are ultimately proved to be unsound, no one will regret their demolition less than myself.

J. T. CUNNINGHAM.

CONTENTS

INTRODUCTION

	PAGE
DIAGNOSTIC CHARACTERS	3
METAMORPHOSIS	16
SEXUAL DIMORPHISM	24

CHAPTER I

MAMMALS

PRIMATES	45
CARNIVORA	65
CETACEA	73
UNGULATA	73

CHAPTER II

BIRDS

PHASIANIDÆ	112
CRACIDÆ	117
TURNICIDÆ	118
COLUMBIDÆ	121
DICIDÆ	127
TROCHILIDÆ	132
CAPRIMULGIDÆ	134
TROGONIDÆ	136
PARADISEIDÆ	137
COTINGIDÆ	140

