Cambridge University Press & Assessment 978-0-521-16514-3 — An Introduction to Animal Behaviour Aubrey Manning , Marian Stamp Dawkins Frontmatter <u>More Information</u>

## AN INTRODUCTION TO ANIMAL BEHAVIOUR

#### **Sixth Edition**

Wolves excitedly greet each other as members of the pack come together; a bumble bee uses its long tongue to reach the nectar at the base of a foxglove flower; a peregrine falcon stoops at high speed to strike a pigeon flying below; young cheetahs rest quietly together, very close to sleep.

Now in full colour, this revised and updated edition of Manning and Dawkins' classic text provides a beautifully written introduction to the fundamentals of animal behaviour. Tinbergen's four questions of causation, evolution, development and function form the fundamental framework of the text, illustrated with fascinating examples of complex behavioural mechanisms. The authors provide accounts of all levels of behaviour from the nerve cell to that of the population. The strengths of *An Introduction to Animal Behaviour* as a textbook include its clear explanations and concise, readable text, and the enthusiasm of the authors for their subject.

AUBREY MANNING, OBE FRSE was Professor of Natural History at the University of Edinburgh. His main research and teaching interests were based around the development and evolution of animal behaviour. He completed his DPhil under Niko Tinbergen and is now Emeritus Professor. He received the Zoological Society of London Silver Medal in 2003 for public understanding of science.

MARIAN STAMP DAWKINS is Professor of Animal Behaviour at the University of Oxford where she heads the Animal Behaviour Research Group. Her research interests lie around animal perceptual worlds, with particular emphasis on animal suffering. She has authored, co-authored and edited eight books dealing with subjects ranging from basic behaviour to animal suffering and consciousness.

Cambridge University Press & Assessment 978-0-521-16514-3 — An Introduction to Animal Behaviour Aubrey Manning , Marian Stamp Dawkins Frontmatter <u>More Information</u>



© in this web service Cambridge University Press & Assessment

Cambridge University Press & Assessment 978-0-521-16514-3 — An Introduction to Animal Behaviour Aubrey Manning , Marian Stamp Dawkins Frontmatter <u>More Information</u>

# AN INTRODUCTION TO ANIMAL BEHAVIOUR

## Sixth Edition

Aubrey Manning University of Edinburgh

Marian Stamp Dawkins

University of Oxford



Cambridge University Press & Assessment 978-0-521-16514-3 — An Introduction to Animal Behaviour Aubrey Manning , Marian Stamp Dawkins Frontmatter <u>More Information</u>



Shaftesbury Road, Cambridge CB2 8EA, United Kingdom

One Liberty Plaza, 20th Floor, New York, NY 10006, USA

477 Williamstown Road, Port Melbourne, VIC 3207, Australia

314-321, 3rd Floor, Plot 3, Splendor Forum, Jasola District Centre, New Delhi - 110025, India

103 Penang Road, #05-06/07, Visioncrest Commercial, Singapore 238467

Cambridge University Press is part of Cambridge University Press & Assessment, a department of the University of Cambridge.

We share the University's mission to contribute to society through the pursuit of education, learning and research at the highest international levels of excellence.

www.cambridge.org Information on this title: www.cambridge.org/9780521165143

© Aubrey Manning and Marian Stamp Dawkins 2012

This publication is in copyright. Subject to statutory exception and to the provisions of relevant collective licensing agreements, no reproduction of any part may take place without the written permission of Cambridge University Press & Assessment.

First published 2012 3rd printing 2020

A catalogue record for this publication is available from the British Library

Library of Congress Cataloging-in-Publication data

Manning, Aubrey.
An introduction to animal behaviour / Aubrey Manning, Marian Stamp Dawkins. - 6th ed.
p. cm.
Includes bibliographical references and index.
ISBN 978-1-107-00016-2 (Hardback) - ISBN 978-0-521-16514-3 (Paperback)
1. Animal behavior. I. Dawkins, Marian Stamp. II. Title.
QL751.M22 2012
591.5-dc23 2011027496

ISBN 978-1-107-00016-2 Hardback ISBN 978-0-521-16514-3 Paperback

Additional resources for this publication at www.cambridge.org/9780521165143

Cambridge University Press & Assessment has no responsibility for the persistence or accuracy of URLs for external or third-party internet websites referred to in this publication and does not guarantee that any content on such websites is, or will remain, accurate or appropriate.

Cambridge University Press & Assessment 978-0-521-16514-3 — An Introduction to Animal Behaviour Aubrey Manning , Marian Stamp Dawkins Frontmatter <u>More Information</u>

## CONTENTS

#### Preface page ix

#### **1 Introduction** 1 Questions about animal behaviour 5 The escaping cockroach 7 The courtship of the sage grouse 11 Units of the nervous system 16 Reflexes and more complex behaviour 20 Diversity and unity in the study of behaviour 30 Summary 31

### **2** The development of behaviour 33

Young animals grow up 34 Instinct and learning in their biological setting 40 The characteristics of instinct and learning 45 Genetics and behaviour 49 Development and changes to the nervous system 57 Hormones and early development 62 Early experience and the diversity of parental behaviour 68 Play 78 Imprinting 84 Bird song development 94 Conclusions 106 Summary 106

#### **3 Stimuli and communication** 109 What stimuli are and how they act 111 Diverse sensory capacities 114

V

Cambridge University Press & Assessment 978-0-521-16514-3 — An Introduction to Animal Behaviour Aubrey Manning, Marian Stamp Dawkins Frontmatter More Information

#### vi Contents

The problem of pattern recognition 126 Sign stimuli (key features) 128 'Supernormal' stimuli 130 Neuroethological basis of sign stimuli 135 Other solutions for pattern recognition: generalized feature detection 139 Communication 144 What is communication? 145 Animal signals as effective stimuli 150 Honesty and deception in animal signalling 159 The honeybee dance 164 The calls of vervet monkeys 173 Summary 177 4 Decision-making and motivation 179 Decision-making on different time scales 182 Decision-making and 'motivation' 193 Measuring motivation 193 Is motivation specific or general? 199 Goals as decision points 202 Homeostasis and negative feedback 205 Competition between motivations 209 211 Inhibition/disinhibition Decision-making with incomplete information: the role of signals 213 Conflict and 'abnormal' behaviour 217 The physiology of decision-making 220 Hormones and sequences of behaviour 227 Conflict and physiological stress 232 Decision-making, motivation and animal welfare 233 Conclusions 236 Summary 237 239

#### 5 Learning and memory

Learning as part of adaptation 239 Sensitization and habituation 242 Associative learning 246 Specialized types of learning ability 257 What do animals actually learn? 262 Are there higher forms of learning in animals? 264 The comparative study of learning 268 Social learning and culture 272 The nature of animal minds 276

Cambridge University Press & Assessment 978-0-521-16514-3 — An Introduction to Animal Behaviour Aubrey Manning , Marian Stamp Dawkins Frontmatter <u>More Information</u>

#### Contents

The nature of memory 294 Summary 298

#### **6 Evolution** *301*

The adaptiveness of behaviour 302 Genes and behavioural evolution 310 Kin selection and inclusive fitness 316 Evolutionarily stable strategies 328 Sex and sexual selection 336 Species isolation and species selection 345 Tinbergen's fourth question: the phylogeny of behaviour 348 Summary 353

#### **7** Social organization 355

The individual in the crowd 355 Advantages of grouping 358 Diverse social groups 364 Eusociality: division into castes 364 Territory in the social organization of vertebrates 369 Mating systems and social organization 373 Dominance in social systems 378 Diverse mammalian social behaviour 381 Primate social organization 388 Summary 403

References 405 Figure credits 435 Index 442 vii

Cambridge University Press & Assessment 978-0-521-16514-3 — An Introduction to Animal Behaviour Aubrey Manning , Marian Stamp Dawkins Frontmatter <u>More Information</u>

PREFACE

It is 14 years since the last edition and the science or sciences of animal behaviour have progressed enormously. Topics which justified only a brief mention in an introductory text then, for example sperm competition as a factor in mating systems, have prospered to require textbooks of their own. How then to approach a new edition which cannot be allowed to become significantly larger.

It is our conviction that an introduction to the whole field, or at least a substantial part of it, remains as important as ever. Discussing new areas of research is best done from a firm basis of the basic concepts and for us these are still embodied in Niko Tinbergen's 1963 'Four Questions for Ethology' – function, evolution, causation and development. So the plan of our book remains essentially that of the other editions. There has been some extensive rewriting and we have tried to give good coverage to those areas where there have been important advances, notably in the evolution of behaviour and its development. We continue to give extensive references so that readers can easily get into the literature of areas that catch their interest. There is a great deal of new literature to be explored but we have never cited new work unless it really adds something. Often concepts are best illustrated by some of the now classical papers.

This edition benefits enormously from the encouragement we have had from Cambridge University Press to illustrate more widely and, in particular, to use colour photographs. Animals behaving provide stunning images and we are delighted with many of the new figures here. It remains to acknowledge the great help and support we have had from Martin Griffiths – it was he who first persuaded us to undertake a new edition. His team at CUP have helped us at every stage and it has been a pleasure to work with them.

Aubrey Manning Marian Stamp Dawkins

ix