CAMBRIDGE

Cambridge University Press
0521834139 - The Evolution of Darwinism: Selection, Adaptation, and Progress in Evolutionary Biology
Timothy Shanahan
Frontmatter
More information

# The Evolution of Darwinism

*Selection, Adaptation, and Progress in Evolutionary Biology*

"How extremely stupid of me not to have thought of that!"
Thomas Henry Huxley, upon first encountering
Darwin's theory of evolution by natural selection

Alas, the apparent simplicity of Darwin's theory is deceptive. From the very beginning it has been subject to differing interpretations, and even now professional opinion is sharply divided on a range of fundamental issues, among them the nature of selection, the scope of adaptation, and the question of evolutionary progress. This book traces these issues from Darwin's own evolving quest for understanding to ongoing contemporary debates, and explores their implications for the greatest questions of all: where we came from, who we are, and where we might be heading.

Written in a clear and nontechnical style, this book will be of interest to students, scholars, and anyone wishing to understand the development of evolutionary theory.

Timothy Shanahan is Professor of Philosophy at Loyola Marymount University.

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521834139 - The Evolution of Darwinism: Selection, Adaptation, and Progress in Evolutionary Biology
Timothy Shanahan
Frontmatter
More information

*To Ed, Ernan, and Phil, for showing me how.*

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521834139 - The Evolution of Darwinism: Selection, Adaptation, and Progress in Evolutionary Biology
Timothy Shanahan
Frontmatter
More information

# The Evolution of Darwinism

## *Selection, Adaptation, and Progress in Evolutionary Biology*

TIMOTHY SHANAHAN
*Loyola Marymount University*

CAMBRIDGE
UNIVERSITY PRESS

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521834139 - The Evolution of Darwinism: Selection, Adaptation, and Progress in Evolutionary Biology
Timothy Shanahan
Frontmatter
More information

PUBLISHED BY THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE
The Pitt Building, Trumpington Street, Cambridge, United Kingdom

CAMBRIDGE UNIVERSITY PRESS
The Edinburgh Building, Cambridge CB2 2RU, UK
40 West 20th Street, New York, NY 10011-4211, USA
477 Williamstown Road, Port Melbourne, VIC 3207, Australia
Ruiz de Alarcón 13, 28014 Madrid, Spain
Dock House, The Waterfront, Cape Town 8001, South Africa

http://www.cambridge.org

© Timothy Shanahan 2004

This book 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.

First published 2004

Printed in the United States of America

*Typeface* ITC New Baskerville 10/13 pt. *System* LaTeX 2ε [TB]

*A catalog record for this book is available from the British Library.*

*Library of Congress Cataloging in Publication Data*

Shanahan, Timothy, 1960–
The evolution of Darwinism : selection, adaptation, and progress in evolutionary biology / Timothy Shanahan.
p. cm.
Includes bibliographical references and index.
ISBN 0-521-83413-9 (hardback) – ISBN 0-521-54198-0 (pbk.)
1. Evolution (Biology) – History. 2. Natural selection – History. 3. Adaptation (Biology) – History. 4. Evolution (Biology) – Philosophy. 5. Natural selection – Philosophy. 6. Adaptation (Biology) – Philosophy. I. Title.
QH361.S43 2004
576.8′2–dc22 2003058439

ISBN 0 521 83413 9 hardback
ISBN 0 521 54198 0 paperback

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521834139 - The Evolution of Darwinism: Selection, Adaptation, and Progress in Evolutionary Biology
Timothy Shanahan
Frontmatter
More information

"What a magnificent view one can take of the world: Astronomical causes, modified by unknown ones, cause changes in geography & changes of climate superadded to change of climate from physical causes – these superinduce changes of form in the organic world, as adaptation & these changing affect each other, & their bodies, by certain laws of harmony keep perfect in these themselves – instincts alter, reason is formed, & the world peopled with Myriads of distinct forms from a period short of eternity to the present time, to the future – How far grander than idea from cramped imagination that God created. . . . How beneath dignity of him, who is supposed to have said let there be light & there is light."

– Charles Darwin, D Notebook, pp. 36–37 [6 August 1838]

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521834139 - The Evolution of Darwinism: Selection, Adaptation, and Progress in Evolutionary Biology
Timothy Shanahan
Frontmatter
More information

# Contents

Introduction *page* 1
*Listen to Your Mother* 1
*"How Extremely Stupid Not to Have Thought of That!"* 2
*Selection, Perfection, Direction* 3
*Science and Religion* 4
*Methodological Confessions* 6
*Darwin's Long Shadow* 6

I: SELECTION

1 Darwin and Natural Selection 11
*Introduction* 11
*Natural Selection* 22
*Possibilities and Boundaries* 32
*Summary: Darwin and Natural Selection* 35

2 The Group Selection Controversy 37
*Introduction* 37
*The Population Problem* 39
*Group Selection Under Fire* 49
*Group Selection Resurgent* 54
*Summary: The Group Selection Controversy* 61

3 For Whose Good Does Natural Selection Work? 63
*Introduction* 63
*The Evolutionary Problem of Altruism* 64
*Genes versus Organisms* 66
*Gene Selection versus Gene Selectionism* 69
*Causality and Representation* 72



© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521834139 - The Evolution of Darwinism: Selection, Adaptation, and Progress in Evolutionary Biology
Timothy Shanahan
Frontmatter
More information



*Assigning Functional Roles* 76
*Pluralism and Holism* 81
*Summary: For Whose Good Does Natural Selection Work?* 88

II: ADAPTATION

4 Darwin (and Others) on Biological Perfection 93
*Introduction* 93
*Biological Perfection and Imperfection in Pre-Darwinian Natural History* 94
*Biological Perfection in the* Origin of Species 99
*Wallace on Adaptation* 105
*Darwin and Wallace on the Power of Selection* 108
*Summary: Darwin (and Others) on Biological Perfection* 113

5 Adaptation After Darwin 115
*Introduction* 115
*Evolutionary Alternatives After Darwin* 116
*Wright's Shifting Balance Theory* 124
*Adaptation in the Modern Synthesis* 130
*Critiquing "the Adaptationist Programme"* 137
*Summary: Adaptation After Darwin* 142

6 Adaptation(ism) and Its Limits 143
*Introduction* 143
*"Adaptation"* 144
*Adaptationism* 151
*Empirical Adaptationism* 153
*Explanatory Adaptationism* 162
*Methodological Adaptationism* 165
*Summary: Adaptation(ism) and Its Limits* 168

III: PROGRESS

7 Darwin on Evolutionary Progress 173
*Introduction* 173
*Darwin's Evolving View of Progress* 176
*Evolutionary Progress in the* Origin of Species *(1859–1872)* 180
*Progress in* The Descent of Man (1871) 192
*Was Darwin's View Cogent?* 193
*Summary: Darwin on Evolutionary Progress* 194

8 Evolutionary Progress from Darwin to Dawkins 196
*Introduction* 196
*Julian Huxley's Progressive Evolutionism* 197
*Simpson's Pluralistic Conception of Progress* 203
*Gould on Evolutionary Progress* 207

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521834139 - The Evolution of Darwinism: Selection, Adaptation, and Progress in Evolutionary Biology
Timothy Shanahan
Frontmatter
More information



*Dawkins on Evolutionary Progress* 213
*Summary: Evolutionary Progress from Darwin to Dawkins* 218

9 Is Evolution Progressive? 220
*Introduction* 220
*What Is Evolutionary Progress?* 222
*Directional Evolutionary Change* 224
*Improvement* 229
*Is There Long-Term Evolutionary Progress?* 235
*Objections and Replies* 237
*Summary: Is Evolution Progressive?* 246

10 Human Physical and Mental Evolution 247
*Introduction* 247
*Darwin and Wallace on Man* 248
*Darwinism and Human Nature* 256
*Were We Inevitable?* 265
*The Evolutionary Destiny of* Homo Sapiens 274
*Summary: Human Physical and Mental Evolution* 280

*Epilogue* 283

*Appendix: What Did Darwin* Really *Believe About Evolutionary Progress?* 285
*The "Mainstream" Interpretation* 285
*Against the Mainstream Interpretation* 287
*Darwin as a Nonprogressionist* 288
*Conclusion: Darwin the Icon* 293

*Notes* 295

*References* 321

*Index* 339

© Cambridge University Press www.cambridge.org