

EVOLUTION BY NATURAL SELECTION

Confidence, Evidence and the Gap



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MICHAELIS MICHAEL

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Species and Systematics

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I dedicate this book to the memory of my father, Stephanos Michael (July 25, 1927–January 23, 2015). I wanted to finish this book in time to show him; sadly, he died before I could finish it. My father was a strange and wonderful man. He grew up on a farm in Cyprus. From the age of twelve, he was taken out of school and was not allowed to realize his own aspirations to get an education. He raised a pair of oxen from calves and trained them to the plow. Barefoot, he plowed the family farm. He travelled across the world to Australia, a place he'd barely heard of. He made sure that I got the education he missed out on. I grew up in a major city, but many weekends were spent in the bush with him. As the song says, "As a boy he'd take me walking by mountain field and stream, and he'd show me things not known to kings, and secret between him and me." I miss him.

Contents

Series Preface.....	xi
Acknowledgments.....	xiii
Author	xv
Chapter 1 Introduction	1
What Is Evolution?	6
What Was Darwin Trying to Explain?	7
Diversity	8
Adaptation	8
References	9
Chapter 2 The Circularity Argument.....	11
The Simple Circularity Argument	12
Modified Versions of the Circularity Argument	13
Bad Reasons to Dismiss the Circularity Argument	14
The Real Problem Raised by the Arguments: No Explanations	16
References	19
Chapter 3 Resolving the Problem of Circularity.....	21
What Is Fitness?	22
Fitness and Adaptation: The Key Concepts	25
Fitness and Probability.....	32
Long-Run Frequency Account	34
Subjective Betting Rate Account.....	35
Logical Account	37
Propensity or Objective Chance Account.....	38
Rejecting the Idea of Fitness as a Probability	40
Bayesianism Does Not Save the Day.....	41
Tendency to Survive—Fitness as a Disposition	41
Defining Natural Selection.....	45
Conclusion.....	50
References	50
Chapter 4 Darwin’s Key Argument for Evolution by Natural Selection.....	53
The Argument Darwin Uses	53
A Proto-Theory of Natural Selection	57
References	63

Chapter 5	Explanation, Causation, and Counterfactuals	65
	Natural Selection as Explanation of Evolution.....	65
	Natural Selection, Causation, and Counterfactual Dependence	67
	Natural Selection and Functional Explanation.....	69
	Optimal Creation.....	70
	Functional Explanation and Counterfactual Dependence.....	71
	Does Chance Play a Role in Darwin's Theory?	75
	Extensionalist Reductionism, Causation, and Explanation:	
	The Case of the Identity Theory of Mind	79
	Arguing against the Identity Thesis	80
	Skeptical Reactions	82
	Change Our Understanding of the Mental?.....	82
	But Causal Contexts Are Opaque.....	83
	Reducing "Being Unlocked": A Parallel Case?.....	83
	Functionalism and the Denial of the Identity Thesis	87
	Explanations and Reductions	89
	Genetic Determinism and Genetic Reductionism.....	90
	References	94
 Chapter 6	 Philip Henry Gosse and the Geological Knot.....	 97
	Expertise and the Openness of Scientific Knowledge	97
	Religion and Science	98
	Popper's Doubts about Darwinism.....	99
	Reconciliation by Displacement.....	101
	Is Evolutionary Theory Scientific?	110
	The Positivist Story: Inductive Logic and Confirmation	111
	The Paradox of Confirmation.....	112
	The Bayesian Response	114
	Karl Popper's Demarcation of Science	115
	Some Objections to Popper	116
	The Theory-Laden Nature of Observation	116
	The "Inductive" Character of Falsification.....	117
	The Logical Problems with Falsification.....	118
	Is Evolutionary Theory Falsifiable?.....	119
	Lessons about Falsification and Science	120
	Science and Evolution: What the Science Guy Could Have Said	123
	References	126
 Chapter 7	 Heritability of Characteristics: The Role of Genetics and Epigenetics.....	 127
	Genotypes and Phenotypes	128
	The Functional Relationship between Genotype and Phenotype	129

Insulation: The Contrast between “Genetic” and
“Environmental” Traits 130

Genetics as a Mechanism of Heredity..... 133

Heritability: Different Notions 134

 Heritability as Correlation..... 135

 Genetic Heritability in the Broad Sense..... 136

 Genetic Heritability in the Narrow Sense 137

Genes as a Mechanism, Not the Meaning of Heredity 138

What Heritability Tells Us about the Genetic Perspective
on Evolution..... 139

What Does Epigenetics Do to the Theory of Natural Selection?..... 140

The Nature/Nurture Debate 141

English is Biologically Heritable..... 142

References 143

Chapter 8 Concluding Remarks 145

Glossary 149

Series Preface

The *Species and Systematics* series is a broad-ranging venue for authors to provide the scientific community with comprehensive treatments of the theoretical underpinnings, history, and philosophy of fundamental concepts in systematic biology and the science of taxonomy. The series also intends to link the historical landscape of ideas to new technology and expanding information in order to stimulate discussion among students and researchers in biology about the future course we are charting in biodiversity research.

There are many approaches to the study of biological diversity, and to embrace this, future volumes in *Species and Systematics* may include detailed development and comparisons of existing and novel methods in systematics and biogeography, empirical studies of exemplar organisms that provide new insight into old questions and raise new questions for biologists and philosophers of science, and historical treatises on central and reoccurring concepts that benefit from both a retrospective and a new perspective. Some volumes will address a single important concept at great depth, giving authors the freedom to present ideas with their own slant, while others will be edited collections of shorter papers intended to place alternative views in sharp contrast.

One of the most important tasks for philosophers and historians is to *stress test* our terms and concepts so that we are pushed to reevaluate what we know or think we know. To draw on popular culture, the film character Inigo Montoya's now meme-famous saying sums this up well, "You keep using that word, I do not think it means what you think it means" (*The Princess Bride*, 1987). This volume contributed by Michaelis Michael is a call to all biologists to consider if they really know what they mean when using or discussing one of our most central ideas—Darwin's theory of natural selection. From different vantage points, Michael shows how easy it is to use natural selection and, simultaneously, how hard it can be to directly access particulars. Readers are guided through carefully laid-out arguments that test the mettle of natural selection and put a spotlight on strengths and weakness, encouraging precise usage. In this way, *Evolution by Natural Selection: Confidence, Evidence and the Gap* is a valuable contribution that hits the mark intended for the *Species and Systematics* series.

Kipling Will
Berkeley, CA
September 9, 2015

Acknowledgments

The first and last person to thank is my wife, Aislinn Batstone. She has been my rock. I love and appreciate her, and this would not have happened without her. My kids, Stefan, Druce, and Nora, have kept me on the straight and narrow and reminded me what life is all about. I would also like to thank Malte Ebach for encouraging me to write this book and for being a consistent sounding board and Chuck Crumly and Jennifer Ahringer at Taylor and Francis for being so helpful and accommodating. Colleagues and friends have been very good to me, in particular, Karyn Lai, Damian Grace, Steve Cohen, Debra Aarons, Mengistu Amberber, Matthew Mison, Andrew Horne, Jim Franklin, Markos Valaris, and Melissa Merritt. I have been very lucky to have valued and talented friends in James Bucknell, Adam Dickerson, Amitavo Islam, and Max Rabie, who have been very helpful in providing comments and encouragement. Andrew Westcombe stepped in and helped enormously with the final proof reading; his help was generous and beyond the call of friendship. In 2001, I was invited to visit the Department of Philosophy at Wake Forest University as a Thomas Jack Lynch Visiting Associate Professor, where I presented some of this material. I thank the department and especially Prof. Ralph Kennedy, who has become a very good friend and collaborator. I have been sitting on a lot of this material for a very long time. Tom Rich had encouraged me to publish it many years ago, and so did Allen Hazen. Both were transplanted Americans living in my home town of Melbourne, Australia, and both gave me good advice that I took far too long to follow.

Author



Michaelis Michael studied Zoology and Philosophy at Monash University in Melbourne, Australia, before achieving a PhD in Philosophy at Princeton University. He works across a number of areas in philosophy, from human rights to formal logic. He has recently published articles and contributed chapters on the role of noncognitive factors in religious conversion, on the metaphysics of mind, and against the idea that we need to adopt deviant logics to deal with inconsistent theories in science.

