

Contents

Contributors	v
Preface	vii
1 On Some Fundamental Concepts of Darwinian Biology	
<i>Theodosius Dobzhansky</i>	1
Introduction	1
Vitalism, Mechanism, and Compositionism	3
Adaptedness and Adaptation	5
Adaptedness to Survive and to Reproduce	7
Adaptability	9
Evolutionary Plasticity	11
The Problem of Quantification of Adaptedness	12
Darwinian Fitness	15
Varieties of Natural Selection	18
Darwinian Fitness and Adaptedness	21
Evolutionary Opportunism and Adaptive Radiation	23
Progressive Evolution	27
References	32
2 Cave Ecology and the Evolution of Troglobites	
<i>Thomas C. Barr, Jr.</i>	35
Introduction	36
Animal Life in Caves	43
The Cave Ecosystem	47
Regressive Evolution in Cave Animals	69
Speciation and Adaptation in Troglobites	80
References	96
3 Molecular Biology and Bacterial Phylogeny	
<i>J. De Ley</i>	103
Introduction	104
The Evolution of Microorganisms in the Precambrian	105
Microbial Fossils	114
Bacteria as "Living Fossils"	117
The Relationship Between Bacteria and Bluegreen Algae	119
DNA Nucleotide Composition of Microorganisms	122
Evolutionary Changes in Bacterial DNA	128
DNA Homology	138
Phenotypic Aspects of Bacterial Evolution	148
Summary	151
References	153

4	Evolutionary Implications of Sexual Behavior in <i>Drosophila</i>	
	<i>Herman T. Spieth</i>	157
	Introduction	157
	Types of Behavior	158
	<i>Drosophila</i> Preview	159
	Ontogeny of Mating Behavior	160
	Basic Courtship Patterns	160
	Adaptive Nature of Mating Behavior	165
	Specialized Mating Behavior of Hawaiian Species	168
	Summary of Mating Behavior	170
	Nature and Function of the Stimuli	171
	Mating Behavior of Other Diptera	175
	Significance of <i>Drosophilid</i> Mating Behavior	176
	Lek Behavior	178
	Sexual Isolation	181
	Intraspecific Variations	182
	Interspecific Behavior	185
	Origin of Sexual Isolation	190
	Conclusion	191
	References	191
5	Evolution of Photoreceptors	
	<i>Richard M. Eakin</i>	194
	Introduction	194
	Ciliary Photoreceptors	196
	Rhabdomeric Photoreceptors	201
	Ciliary Line of Evolution	205
	Rhabdomeric Line of Evolution	216
	Other Taxa	233
	Protostomes Versus Deuterostomes	234
	References	235
6	Evolution and Domestication of the Dog	
	<i>J. P. Scott</i>	243
	Introduction	244
	Taxonomy and Distribution of the Genus <i>Canis</i>	244
	Origin of the Dog	245
	Further Evidence for the Wolf as Ancestor to the Dog	246
	Time of Domestication	249
	The Place of Domestication	250
	The Process of Domestication	252
	Evolution of the Wolf	259
	Evolution of the Dog	260

Evolution of Behavior in Dogs and Wolves	264
Theoretical Considerations	268
References	274
7 A Sampler of Human Behavioral Genetics	
<i>Irving I. Gottesman</i>	276
Introduction	276
The Nature of Psychological Traits	278
The Twin Method	287
Intellectual Abilities	289
Schizophrenia	302
Summary	313
References	314
8 Suture-Zones of Hybrid Interaction Between Recently Joined Biotas	
<i>Charles L. Remington</i>	321
Introduction	322
Tabulation of Suture-Zone Examples	323
The Individual Nearctic Zones	329
Suture-Zones Outside North America	368
Stabilization After Early Suturing	371
Hybridization Outside Suture-Zones	372
Discussion	374
Acknowledgments	383
Tables	385
Appendix	411
References	415
Author Index	429
Subject Index	441