

Contents

<i>Preface</i>	page xv
<i>Acknowledgments</i>	xvii
1. Introduction	1
The primate order	1
Ape and monkey bias	11
Evolution before natural selection	13
1858–1859: The advent of natural selection theory	15
Essentialism versus population-thinking	20
1863: Thomas Henry Huxley and the place of humans in nature	22
2. A brief history of primatology and human evolution	26
Introduction	26
Antiquity and the Middle Ages	30
The Renaissance to the late eighteenth century	32
The nineteenth century	36
The early twentieth century	37
The “new” physical anthropology	43
1959 – <i>annus mirabilis</i>	44
The baboon renaissance	50
Sociobiology and behavioral ecology	53
3. The catarrhine fossil record	56
The geological time scale	56
Major features of primate evolution	56
The shape and pattern of primate evolution	57
The early catarrhine primates	62
Hominoid systematics	64
The Miocene hominoid radiation	65
Community structure and competition between primate species	70

The end of the hominoid radiation and the rise of the cercopithecoids	73
Climate change in the late Miocene and the first hominids	76
4. Primate speciation and extinction	81
Primate speciation and extinction in the geological past	81
Speciation in modern primates	86
Extinction in modern primates	94
5. Anatomical primatology	107
Introduction	107
Phylogeny and cladistic methodology	107
Adaptation and the “adaptationist program”	115
Studying adaptation	117
The functional morphology of fossil species	119
Ontogeny and anatomical genomics	124
Phenotypic variability	126
6. Captive studies of non-human primates	128
Introduction	128
The influence of captivity on behavior	128
Harry Harlow’s research	130
An inventory of abnormal captive behaviors	130
Biomedical primatology	137
7. What can non-human primate anatomy, physiology, and development reveal about human evolution?	141
The catarrhine substrate	141
8. Natural history intelligence and human evolution	146
Introduction	146
Ideas on the origins of hominid intelligence	150
Hominid attention to natural history	155
Animal behavior and artificial intelligence	157
Natural history intelligence	159
Problems with the social cognition model	163
Further primatological evidence against social cognition as a generator of intelligence	167
Brain mechanisms underlying natural history intelligence	171
Other tests of the social cognition theory	179

Natural history intelligence over the course of human evolution	180
Conclusions	182
9. Why be social? – the advantages and disadvantages of social life	185
Why be social?	185
How to become social	188
Explanations of primate social complexity	194
What is the catarrhine substrate for sociality?	194
10. Evolution and behavior	196
Proximate and ultimate factors in behavioral evolution	196
Factors limiting population size	197
Diet and foraging behavior	198
Cultural traditions	199
Phylogenetic inertia and phylogenetic constraint	201
11. The implications of body size for evolutionary ecology	203
Introduction	203
Measuring body size in fossil species	208
Body size and paleocommunity reconstructions	209
Body size and behavior	213
The all-too-familiar use of sexual dimorphism to infer sociality in fossil species	215
Reversible body size changes in individuals	218
Size and shape changes: adaptation and plasticity	220
Population-level differences in body size	231
What can be inferred from body size in fossil species?	236
The sweating response, body shape, and heat adaptation	239
The evolution of body size in primates	245
Conclusions	248
12. The nature of the fossil record	252
Does the fossil record faithfully record past events?	252
Decimation and recovery from extinction	259
Rates of evolutionary change	262
Time-averaging	265
Taphonomy and experimental studies	266
13. The bipedal breakthrough	271
Introduction	271
Ape models for bipedal origins	271

Behavior and morphology	276
Bipedal efficiency	277
Paleoenvironment	280
Bipedal origins	280
Lessons from <i>Oreopithecus</i>	288
A mixture of morphologies	290
14. The hominid radiation	292
The earliest hominids	292
Plio-Pleistocene hominids	293
The single-species hypothesis	293
Sympatry and multiple hominid niches	298
Sexual dimorphism and niche structure	303
The origin of genus <i>Homo</i>	305
Hominid dispersion from sub-Saharan Africa	306
Asian ape-men: Early ideas about hominid origins in Asia	306
The origins of anatomically modern humans	308
Genetic variation in modern humans	310
15. Modeling human evolution	311
Baboon models	311
Referential and conceptual models	313
A “composite mammal” model	314
16. Archeological evidence and models of human evolution	317
Human antiquity	317
Recognition that the archeological record is not coeval with the human paleontological record	321
Bone modification and inferences of hominid behavior	329
Climatic events and the archeological record	331
“Man the Hunter” and the new physical anthropology	333
Food, food-sharing, and division of labor	336
Pair-bonding	340
Taphonomy and the nature of “sites”	343
The hominization process	344
17. What does evolutionary anthropology reveal about human evolution?	351
Phenotypic change and “contemporary evolution”	351
Body size and shape changes	353

What factors are responsible for the origin of generalized species?	361
Tool behavior and technology	366
Language	369
Early hominid sociality	371
18. Final thoughts on primate and human evolution	382
Speciation, extinction, and other evolutionary processes	382
Terrestrial life and bipedality	384
Tool behavior	385
Intelligence	386
Complex sociality	387
<i>References</i>	389
<i>Index</i>	452