

Preface

"The history of the world, my sweet, is who gets eaten and who gets to eat."
from *Sweeney Todd, the Demon Barber of Fleet Street*
by Stephen Sondheim

The story of primate evolution, as we know it in the later days of the twentieth century, begins humbly with small, innocuous quadrupedal creatures scampering across the nighttime forests of ancient continents, and ends with large-brained, ubiquitous bipedal creatures of the nuclear age of modern nation states. It is a story of dramatic discoveries, heated controversies, uncertain evidence, and few verifiable facts. By retelling the story, warts and all, to new students, it is my hope that some of them will share my enthusiasm for the subject, and future books will come to tell the story more fully. At the very least, readers of this book will emerge with an appreciation for the techniques and limitations of modern paleontological research.

While this book assumes some prior exposure to physical anthropology or biology, anyone with an interest in the biological and/or earth sciences can easily follow the major episodes in primate evolution outlined here simply by starting at the beginning. To bring the history of ancient primates to life, I have minimized the sometimes excessive focus on descriptive anatomy and systematics found in journal articles in favor of aspects of modern primate paleobiology that are more interesting to beginning students. These include the impact of recent studies in paleoclimatology, biogeography, and continental drift on our understanding of how extinct primate populations lived and dispersed across the globe, the functional morphology of the different extinct primate groups, and the use of allometric data in interpreting early primate lifestyles. Since the study of the behavior and morphology of living primates plays an important role in forming hypotheses about extinct primates, I have included many of these studies throughout the book where they seem most relevant. Naturally, no professional paleoanthropologist can get

very far without a fairly detailed understanding of systematics and evolutionary theory, both of which are outlined in the first chapter and discussed and carefully illustrated in each subsequent chapter.

Because of the nature of its subject matter, paleoanthropology is both a science and an art. While its hypotheses may be falsifiable at any time by fresh data, few hypotheses concerning extinct organisms can be confirmed by direct experimental methods. For this reason, disagreements among knowledgeable anthropologists about the nature (but not the fact) of primate evolution abound. I have tried to convey this state of dynamic tension honestly without promoting my views to the exclusion of others. Every chapter clearly presents what I take to be the consensus (though by no means unanimous) view of the major evolutionary events, as well as the important opposing views. My hope is that students will grasp the major events in primate evolutionary history by the end of this book even though its views on specific details or systematic nuances may sometimes differ from those of their professors. This, then, is a book, not an encyclopedia.

The structure and content of this book is derived from lectures in primate evolution I have given over the past 15 years at New York University, Brown University, and Washington University. Chapter 1 gives students the conceptual framework from which to explore the fossils of the various epochs in primate history which follow. Special attention is given in Chapter 1 to developing an understanding of allometric relationships (especially the relationship between diet and dentition), theories of evolutionary change (especially punctuated equilibrium and phyletic gradualism), the geological time scale, radiometric dating techniques, and systematics (especially cladism and evolutionary classification). Perhaps of supreme importance, Chapter 1 outlines the ways in which paleoanthropologists make inferences from primate fossils, a subject that is returned to in virtually every chapter of the book.

Chapters 2 through 6 are arranged by epoch in chronological order beginning 65 MYA at the Paleocene and ending about 1 MYA in the middle of the Plio-Pleistocene. Within each chapter a standard order of topics is followed: paleoclimatology and biogeography, a morphological analysis of the fossils themselves, and finally, the biological inferences and phylogenetic hypotheses that can be drawn from the fossil evidence. The scope of discussion is the earliest primates to the earliest representatives of the *Homo* lineage. Consequently, the evolution of the genus *Homo* is treated only cursorily in Chapter 6, mostly to provide contrast to the developments evident in *Australopithecus*.

Several appendices containing basic information and summary illustrations on geological and paleomagnetic dating, skeletal morphology, correlations of ecological and biological factors in living primates, and systematics will be indispensable for beginning students. The last appendix on systematics provides several different classifications of the order

Primates proposed over the past two decades. I have decided to be less than dogmatic in adopting a particular classification scheme in the text in order to focus students' attention on the more interesting aspects of primate biology. It's my feeling that an obsession with classification can encourage an unfortunate "stamp collecting" mentality in students early on. The appendix is provided for the student's later reference when the issues of classification become more important.

An especially full glossary is provided as a handy aid to interpreting the sometimes overwhelming language of medical anatomy. All new terms are, of course, defined in the text where they are initially introduced.

A book like this is not written in a vacuum. I consider myself fortunate to have been a graduate student in what I would consider Yale's golden years of paleoanthropology, when at any one time you could walk down the hall and talk to David Pilbeam, Elwyn Simons, Rich Kay, Phil Gingerich, Ian Tattersall, Tom Bown, Ken Rose, or John Fleagle and probably get different opinions from each of them! I learned much from my faculty colleagues Cliff Jolly and Jim Shafland at New York University and from the indefatigable George Erikson at Brown University.

While writing a book is never easy, the task was made so much more pleasant by the congenial atmosphere provided by friends and colleagues in the Departments of Anthropology and Anatomy & Neurobiology here at Washington University. To them I am most grateful. I'm particularly indebted to Gerald Fischbach, Chairman of the Department of Anatomy & Neurobiology, for the support and encouragement he has extended to a physical anthropologist hunkered down in the midst of his department, and to Bob and Linda Sussman in the Anthropology Department, who convinced us to move to St. Louis in the first place.

A number of colleagues read and commented on extensive portions of the text. I am especially indebted to Tom Bown, Matt Cartmill, Laurie Godfrey, Cliff Jolly, Henry McHenry, and Randy Skelton for criticism and encouragement. I wish I could blame them for any errors of omission or commission in the text, but alas that responsibility is mine alone! Other colleagues graciously offered the use of photographs, including Peter Andrews, Eric Delson, Bill Kimbel, David Pilbeam, Ken Rose, Jeff Schwartz, Elwyn Simons, Phillip Tobias, Alan Walker, and Tim White.

I must add to this list my gratitude to a number of people who labored with me over the production of the book. Susan Middleton's invaluable efforts brought rhyme and reason to what was sometimes an unwieldy manuscript. Mike Reingold's artistry beautifully captured the nuances of primate anatomy. Joe Wisnovsky revised early drafts of the manuscript, and my assistant Heather Trigg helped with a number of office tasks. And from beginning to end this project was encouraged and supported by my editor at W.W. Norton, Jim Jordan.

Lastly, and most importantly, is the loving support provided at the home front. Molly the wonder dog and Shubel, Jesse, and Chloe, the wonder cats, were always waiting at the door when I came home late at night. And to my wife and colleague, Jane Phillips-Conroy—as Elton John wrote, “how wonderful life is, while you’re in the world.”

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