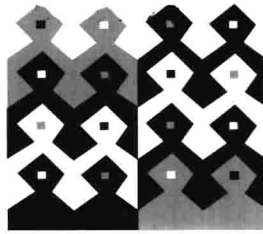




Second Edition

FUNDAMENTALS OF BIOLOGICAL ANTHROPOLOGY

JOHN H. RELETHFORD



SECOND EDITION

FUNDAMENTALS OF BIOLOGICAL ANTHROPOLOGY



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Preface

This text is an abridged and slightly rewritten version of the third edition of *The Human Species: An Introduction to Biological Anthropology*. Why a brief version of another textbook? No single textbook can accommodate perfectly all the different ways in which an introductory course in biological/physical anthropology is taught. Instructors vary in terms of their interests, use of supplemental materials, and allotted time for their courses. This text will serve several audiences for which the larger version might not be as appropriate. First, a shorter text may be more useful for those teaching on a quarter system. Second, some instructors like to assign supplemental readings, and a shorter text suits this arrangement. Third, some instructors prefer texts with less detail than traditional introductory texts; this text fills that need. Finally, the shorter length of this text makes it suitable as one of several texts for courses such as a basic introduction to anthropology or a combined physical anthropology and archaeology course.

This text introduces the field of biological anthropology (also known as physical anthropology), the science concerned with human biological origins, evolution, and variation. The text addresses the major questions that concern biological anthropologists: “What are humans?”, “How are we similar to and different from other animals?”, “Where are our origins?”, “How did we evolve?”, “Are we still evolving?”, “How are we different from one another?”, and “What does the future hold for the human species?”

Organization

The book is divided into four parts. Part One, “Evolutionary Background,” gives readers the grounding they will need in genetics and evolutionary theory to better understand the remainder of the text. Chapter 1 begins with an overview of anthropology and biological anthropology and discusses the scientific method as it relates to evolution. A brief history of evolutionary science and a discussion of the “creation-evolution” debate conclude the chapter.

Chapter 2 reviews molecular and Mendelian genetics as applied to humans in order to provide genetic background for later chapters. It includes a basic review of cell biology. Chapter 3 covers microevolution and macroevolution.

Part Two addresses “Our Place in Nature,” specifically the biology, behavior, and evolution of primates. A main focus of this section is the questions “What are humans?” and “How are we related to other living creatures?” Chapter 4 examines issues in classification and looks at the basic biology and behavior of mammals in general, and primates in particular. This chapter also evaluates the different types of primates in terms of classification, biology, and behavior, with particular attention given to our close relatives, the apes. Chapter 5 looks specifically at the human species and includes a comparison of human traits with those of apes. Chapter 6 examines the fossil record for evolution, looking at dating methods and other techniques of fossil analysis and includes a brief summary of the evolution of life prior to the origin of primates. Chapter 6 concludes with an overview of the major events of primate origins and evolution, from the time of the disappearance of the dinosaurs 65 million years ago to the split of ape and human lines 5–7 million years ago.

Part Three devotes three chapters to “Human Evolution.” Chapter 7 begins with a brief review of human evolutionary history and follows with a detailed summary of the first hominids, the australopithecines, and the emergence of the genus *Homo* characterized by a larger brain and the advent of stone tool technology. Chapter 8 examines the continued biological and cultural evolution of the genus *Homo*. Chapter 9 looks at the fossil and archaeological evidence for the origin of modern humans and includes a discussion of current controversies (Did modern humans evolve throughout the world, or are our recent ancestors exclusively from Africa?).

Part Four focuses on “Human Variation,” with an emphasis on understanding how modern peoples differ from one another and why. This section also looks at the way the human species continues to evolve, both biologically and culturally. Chapter 10 examines different ways we measure human variation and contrasts racial and evolutionary approaches to variation. Chapter 11 provides a number of case studies of microevolution and adaptation in modern and recent human populations. Chapter 12 explores the evolution of patterns of human health and disease in our evolutionary past and in today’s world, as well as changes in the demographic structure of human populations.

Not all instructors will use the same sequence of chapters. Some may prefer a different arrangement of topics. I have attempted to write chapters in such a way as to accommodate such changes whenever possible. For example, some instructors may prefer to cover human variation before the sections on primates and human evolution. In that case, a sequence of Parts One, Four, Two, and Three would work well.

Features

Throughout the text, I have attempted to provide new material relevant to the field and fresh treatments of traditional material. Key features include:

- *All areas of contemporary biological anthropology are covered.* In addition to traditional coverage of areas such as genetics, evolutionary theory, primate behavior, and the fossil record, the text includes material often neglected in introductory texts, such as human health and disease and demography. In addition, the study of human growth is incorporated into several chapters.
- *The relationship between biology and culture is a major focus.* The biocultural framework is introduced in the first chapter and integrated throughout the text.
- *Behavior is discussed in an evolutionary context.* The evolutionary nature of primate and human behavior is emphasized in a number of chapters, including those on primate biology and behavior (4–6) and the fossil record of human evolution (7–9).
- *The emphasis is on the human species in its context within the primate order.* Discussions of mammals and nonhuman primates continually refer back to their potential relevance for understanding the human species. In fact, a separate chapter on the biology and behavior of the human species written from a comparative perspective has been added to this edition.
- *Hypothesis testing is emphasized.* From the first chapter, where students are introduced to the scientific method, I emphasize how various hypotheses are tested. Rather than provide a dogmatic approach with all the “right” answers, the text examines evidence in the context of hypothesis testing. With this emphasis, readers can see how new data can lead to changes in basic models and can better understand the “big picture” of biological anthropology.

New to This Edition

Every chapter has been carefully revised in light of new findings in the field and comments from users of the second edition. In fact, a number of chapters have been re-ordered, added, and merged or deleted based on the helpful feedback I received from colleagues. To make the text as clear, accessible, and up-to-date as possible, I’ve made the following specific changes:

- Each chapter now includes one or more boxes that focuses on a “Special Topic.” Some of the topics focus on contemporary issues (for example, “The Coming Plague?”), some on historical issues (for example, “The Piltdown Hoax”), and some on a wide range of other subjects (for example, “Science Fiction and Orthogenesis”).

- Chapter 4 is devoted to the variation in the biology and behavior of primates and reviews the entire order, from prosimians to the great apes. Case studies on primate behavior have been added and treatment of the bonobo has been expanded.
- A new chapter (5) has been added that focuses exclusively on the human species. Material on the patterns of human growth and their evolutionary significance has been moved here.
- The chapter on primate evolution (6) has been streamlined and revised to emphasize the major evolutionary trends in primate evolution, underlining the issue of Miocene ape diversity and the way it precludes drawing specific family trees.
- The chapter on the first hominids (7) has been revised to begin with a brief summary of human evolution in order to provide a conceptual framework for the student. Information on new species (*Ardipithecus ramidus* and *Australopithecus anamensis*) has been added, as has new information on dating and anatomy. The section on evolutionary trends has been rewritten to minimize phylogenetic arguments and to emphasize basic questions (for example, “Why did we become bipedal?”).
- The chapter on the evolution of the genus *Homo* has been split into two chapters (8 and 9). Chapter 8 now covers *Homo erectus* and “archaic” *Homo sapiens*. New data have been incorporated, including the finding of a possible earlier date for the arrival of *Homo erectus* in Asia. A new Chapter 9 focuses on the origin of modern humans. In addition to a complete revision of the modern human origins debate, this chapter adds new material on modern human archaeology and questions of language origins.
- The chapters on human variation (10–12) have all been placed in a single unit (Part Four). New case studies have been used in Chapter 11 to illustrate human microevolution. The chapter on health and disease and demography (12) has been rewritten to focus on evolutionary issues, and case studies have been revised, added, or deleted to relate to this main point. Material on the secular change in human growth and protein-calorie malnutrition has been moved into Chapter 12.
- The appendix on primate classification has been revised and simplified. Two new appendixes have been added: one on comparative skeletal anatomy and one on metric conversion factors.

Study Helps

To make the text more accessible and interesting, I have included frequent examples and illustrations of basic ideas as well as abundant maps to help orient students. I have kept the technical jargon to a minimum, yet every introductory text contains a number of specialized terms that students must learn. The first mention of these terms in the text appears in **boldface** type

and accompanying short definitions appear in the text margins. A glossary is provided at the end of the book, often with more detailed definitions.

Each chapter ends with a summary and a list of supplemental readings. A list of references appears at the end of the book, providing the complete reference for studies cited in the text.

Ancillaries

The *Instructor's Manual* includes a test bank of more than 500 questions, as well as chapter overviews and outlines, topics for class discussion, and sources for laboratory equipment.

A *Computerized Test Bank* is available free of charge to qualifying adopters. Also available to qualifying adopters is a package of 68 color and black-and-white transparency acetates.

Acknowledgments

My thanks go to the dedicated and hardworking people at Mayfield, both those I have dealt with personally and the others behind the scenes. I give special thanks to Jan Beatty, sponsoring editor, for continued encouragement and support. I am also extremely grateful to Melissa Kreischer, production editor, for her excellence, dedication, and patience. Pam Trainer, permissions editor, and Carol Dondrea, manuscript editor, were also very helpful.

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Last, but not least, I dedicate this to my family: to my wife and best friend, Hollie Jaffe, and to my wonderful sons, David, Benjamin, and Zane. You make it all worthwhile.

Contents

PREFACE

iii



PART ONE EVOLUTIONARY BACKGROUND 1

1 The Study of Biological Anthropology 3

What Is Anthropology?	4
<i>Biology and Culture</i>	4
<i>Variation</i>	5
<i>Evolution</i>	6
<i>Adaptation</i>	6
<i>The Subfields of Anthropology</i>	6
SPECIAL TOPIC: BIOLOGICAL ANTHROPOLOGISTS AT WORK	8
Science and Evolution	11
<i>Characteristics of Science</i>	11
<i>The Development of Evolutionary Theory</i>	13
<i>Evidence for Evolution</i>	18
<i>Science and Religion</i>	20
Summary	23
Supplemental Readings	24

2 Human Genetics 25

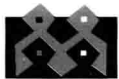
Molecular Genetics	26
<i>DNA: The Genetic Code</i>	26
<i>Chromosomes and Genes</i>	29
SPECIAL TOPIC: PCR AND ANCIENT DNA	30
Mendelian Genetics	33
<i>Genotypes and Phenotypes</i>	35
<i>Predicting Offspring Distributions</i>	37

Chromosomes and Inheritance	38
The Genetics of Complex Physical Traits	40
Mutations	42
Evolutionary Significance of Mutations	42
Types of Mutations	43
Rates of Mutations	43
Summary	44
Supplemental Readings	45

Cell Biology: A Review 46

3 Evolutionary Theory 51

Microevolution	51
Population Genetics	52
Evolutionary Forces	55
Macroevolution	64
Taxonomy and Evolution	65
Patterns of Macroevolution	68
Misconceptions About Evolution	72
The Nature of Selection	72
SPECIAL TOPIC: SCIENCE FICTION AND ORTHOGENESIS	74
Structure, Function, and Evolution	76
Summary	77
Supplemental Readings	78



PART TWO OUR PLACE IN NATURE 79

4 The Primates 81

Taxonomy	81
Methods of Classification	82
The Vertebrates	83
The Mammals	84
Reproduction	85
Temperature Regulation	86
Teeth	86

<i>Skeletal Structure</i>	88
<i>Behavior</i>	89
Primate Characteristics	90
<i>The Skeleton</i>	90
<i>Vision</i>	91
<i>The Brain and Behavior</i>	92
<i>Reproduction and Care of Offspring</i>	93
SPECIAL TOPIC: SOCIAL STRUCTURE AND TESTES SIZE	
IN PRIMATES	94
<i>Social Structure</i>	94
Types of Primates	97
<i>Prosimians</i>	99
<i>Anthropoids</i>	99
The Monkeys	100
<i>New World Monkeys</i>	100
<i>Old World Monkeys</i>	101
The Hominoids	104
The Living Apes	107
<i>Gibbons and Siamangs</i>	108
<i>Orangutans</i>	109
<i>Gorillas</i>	110
<i>Chimpanzees</i>	112
<i>Bonobos</i>	113
Summary	116
Supplemental Readings	117

5 The Human Species 118

Characteristics of Living Humans	119
<i>Distribution and Environment</i>	119
<i>Brain Size and Structure</i>	119
<i>Bipedalism</i>	122
<i>Canine Teeth</i>	125
<i>Sex and Reproduction</i>	126
<i>Human Growth</i>	126
<i>Social Structure</i>	130
Are Humans Unique?	131
<i>Tool Use and Manufacture</i>	132
SPECIAL TOPIC: CAN APES MAKE STONE TOOLS?	134
<i>Language Capabilities</i>	135
Summary	140
Supplemental Readings	140

6 Primate Origins and Evolution 141

The Fossil Record	141
<i>Dating Methods</i>	142
<i>Reconstructing the Past</i>	146
Evolution Before the Primates	147
<i>The Origin of Life</i>	147
SPECIAL TOPIC: KILLER FROM THE SKY?	148
<i>The Paleozoic Era</i>	149
<i>The Mesozoic Era</i>	151
Early Primate Evolution	153
<i>Overview of Early Primate Evolution</i>	154
<i>Primate Origins</i>	154
<i>Anthropoid Origins</i>	158
SPECIAL TOPIC: THE GIANT APE	160
Evolution of the Miocene Apes	161
<i>The Diversity of Miocene Apes</i>	162
<i>The Fossil Evidence</i>	163
<i>Genetic Evidence</i>	168
<i>Conclusions</i>	170
Summary	173
Supplemental Readings	174



PART THREE HUMAN EVOLUTION 175

7 Human Origins 177

Overview of Human Evolution	177
The First Hominids	180
<i>Early Species</i>	180
<i>Later Australopithecines</i>	187
<i>Homo habilis</i>	192
<i>General Physical Characteristics</i>	193
<i>Behavior</i>	195
Evolutionary Trends	197
<i>Evolutionary Relationships</i>	197
<i>The Origin of Bipedalism</i>	200
<i>The Increase in Brain Size</i>	203
SPECIAL TOPIC: THE PILTDOWN HOAX	204
Summary	206
Supplemental Readings	207

8 The Evolution of the Genus *Homo* 208

<i>Homo erectus</i>	208
<i>Distribution in Time and Space</i>	209
<i>General Physical Characteristics</i>	211
<i>Cultural Behavior</i>	215
Archaic <i>Homo sapiens</i>	219
<i>Distribution in Time and Space</i>	220
<i>Physical Characteristics</i>	223
SPECIAL TOPIC: NEANDERTALS: NAMES AND IMAGES	225
<i>Cultural Behavior</i>	228
Summary	230
Supplemental Readings	231

9 The Origin of Modern Humans 232

Anatomically Modern <i>Homo sapiens</i>	233
<i>Distribution in Time and Space</i>	233
<i>Physical Characteristics</i>	235
<i>Cultural Behavior</i>	235
The Origin of Anatomically Modern <i>Homo sapiens</i>	241
<i>Current Models and Debates</i>	242
<i>The Fossil Evidence</i>	244
<i>The Genetic Evidence</i>	246
<i>Consensus?</i>	250
<i>Why Did Modern Humans Evolve?</i>	250
SPECIAL TOPIC: THE ICEMAN	252
Recent Biological and Cultural Evolution in <i>Homo sapiens</i>	253
Summary	256
Supplemental Readings	256



PART FOUR HUMAN VARIATION

10 The Study of Human Variation 259

Measuring Human Variation	263
<i>Biochemical Variation</i>	263
<i>Complex Trait Variation</i>	265
The Racial Approach to Variation	266
<i>The Biological Concept of Race</i>	267
<i>Problems with the Concept of Race</i>	268

SPECIAL TOPIC: GENETICS, RACE, AND IQ	274
The Evolutionary Approach to Variation	276
<i>The Analysis of Gene Flow and Genetic Drift</i>	278
<i>The Analysis of Natural Selection</i>	280
Summary	283
Supplemental Readings	283

11 Human Microevolution 285

Case Studies of Gene Flow and Genetic Drift	285
SPECIAL TOPIC: THE BIOLOGICAL HISTORY	
OF THE ANCIENT EGYPTIANS	286
<i>Social Organization and Genetics of South American</i>	
<i>Indians of the Rain Forest</i>	287
<i>The Vikings and Irish Population History</i>	288
Case Studies of Natural Selection	290
<i>Hemoglobin, Sickle Cell, and Malaria</i>	290
<i>The ABO Blood Group and Natural Selection</i>	297
<i>Lactase Deficiency</i>	300
<i>Skin Color</i>	301
<i>Natural Selection or Developmental Acclimatization?</i>	305
Summary	308
Supplemental Readings	308

12 Human Biology and Culture Change 309

The Evolution of Human Disease	310
<i>Disease in Hunting-Gathering Societies</i>	310
<i>Agriculture and Disease</i>	313
<i>Urbanization and Disease</i>	315
<i>Culture Contact</i>	317
<i>The Epidemiologic Transition</i>	318
<i>Secular Changes in Human Growth</i>	323
<i>Some Contemporary Issues</i>	325
SPECIAL TOPIC: THE COMING PLAGUE?	329
The Demographic Evolution of Human Populations	330
The Study of Demography	331
Demography and the Modern World	334
SPECIAL TOPIC: THE BABY BOOM	336
<i>Implications of Changing Age Structure</i>	339
Summary	341
Supplemental Readings	342

Epilogue: The Future of Our Species	343
Appendix 1 Taxonomy of Living Primates	345
Appendix 2 Conversion Factors	350
Appendix 3 Comparative Skeletal Anatomy	351
Glossary	354
References	364
Index	374

PART ONE

Evolutionary Background

