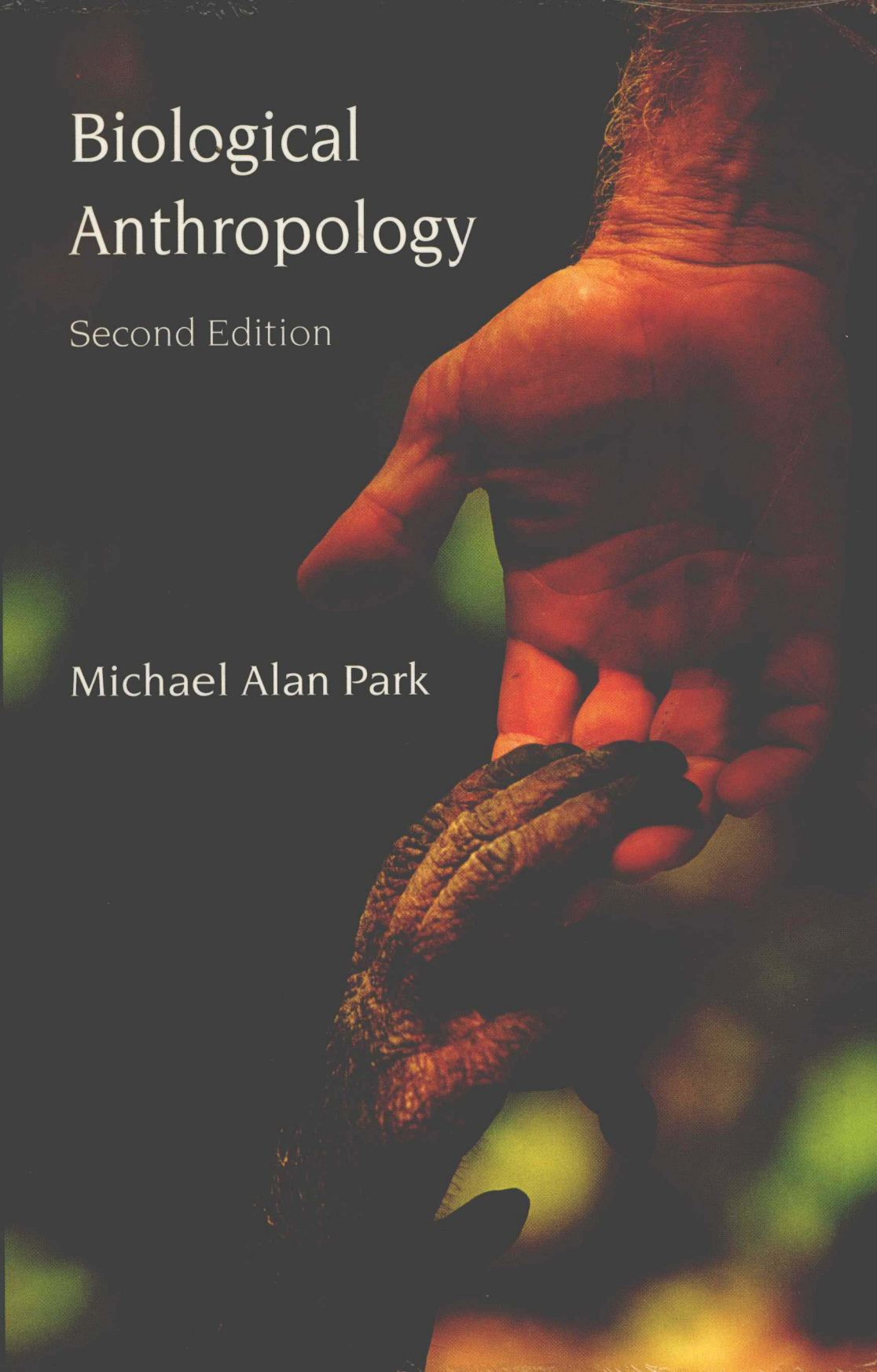


# Biological Anthropology

Second Edition

Michael Alan Park



# BIOLOGICAL ANTHROPOLOGY

SECOND EDITION

MICHAEL ALAN PARK

CENTRAL CONNECTICUT STATE UNIVERSITY



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BIOLOGICAL  
ANTHROPOLOGY

# To the Instructor

Contemporary biological anthropology is a dauntingly broad field. It studies humans in the same way that zoologists study their subject species—from a perspective that includes *all* aspects of the species' biology and that emphasizes the interrelationships among those aspects. In addition to the traditional topics of the human fossil record and human biological variation, bioanthropology includes primatology, modern technologies in molecular genetics, human demography, development of the individual, life histories, and such applications as forensic anthropology. Bioanthropology also appreciates that our cultural behavior is an integral part of our behavior as a species.

No wonder then, that I (and others I have spoken to) have had difficulty in covering the entire field in a one-semester course. We have ended up leaving out important aspects (or paying them little more than lip service), or we have sacrificed a sense of bioanthropology as an integrated whole to a rushed and encyclopedic inventory of all the field's current topics.

As modern bioanthropology increased in breadth and complexity over the past several decades, so, too, did the size and detail of introductory texts. Several are now more than 600 pages long. To date, attempts to produce shorter introductory texts have consisted of simply cutting out parts of these existing tomes, resulting in rather uneven, sometimes oddly organized presentations of the field.

I wrote this text in order to present a diverse scientific field to beginning students. Here are the major assumptions that guided my writing:

- Because this is a text for introductory courses, I have tried to reduce the field to its most basic information. No part of the discipline has been left out; instead I have achieved brevity by managing the amount of detail and including only the information necessary to clearly and accurately convey the basic themes, theories, methods, and facts of bioanthropology.
- The text assumes that students have limited background knowledge of the material and little understanding of what science is and how it

works. The text *explains* rather than simply itemizes facts and ideas, and it does so, as much as possible, in a narrative format. A lesson from the study of folklore is that a story is far more easily understood and retained than is a list of facts.

- I want students to feel that they are reading a text written by a real person who has participated in the field. I have tried to achieve a balance between an informal style and formal style, and I have not shied away from the occasional colloquialism or personal comment.

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## FEATURES

I've included a number of features that I hope will make this text a more useful learning tool for students.

- *I've used the scientific method as a theme throughout the book to demonstrate the integrity and nature of bioanthropology.* I describe the scientific method and then, because this is anthropology, compare science to knowledge garnered from belief systems, discussing the relationship of these two spheres of inquiry and knowledge within cultures. I try to show specifically how scientific reasoning has provided us with the knowledge we have about the topics in bioanthropology. For example, I've presented extended discussions of bipedalism and the issue of modern human origins by posing questions, suggesting answers, and then testing the logic of and evidence for those answers.
- *The text is organized to help students navigate their way through what is still a fairly hefty amount of information.* To help students feel a little less at sea in the midst of new facts and ideas, I regularly refer back to previous topics and ahead to topics that will be covered. The headings I use as signposts are as descriptive as possible (for example, "Natural Selection: The Prime Mover of Evolution").
- *Within chapters, a consistent format helps students better understand material new to them.* Each chapter starts with an **introduction** that sets the stage and context for what's to come, which is followed by a series of **questions** that the chapter will answer. Because science proceeds by asking and answering questions, this format is also used within the body of the text. Important **terms** are in boldface and are defined in the margins at their first appearance. Each chapter concludes with a list of key terms and a **summary** that not only recaps the important points of the chapter but also provides some new ideas and thoughts that help put the chapter into context within the whole discipline. A list of **suggested readings**, made up mostly of nontechnical works, tells students where to find more information about the chapter topics.



- *Two glossaries, a bibliography, and a comprehensive index make information more accessible.* A Glossary of Human and Nonhuman Primates with a pronunciation guide defines taxonomic names for taxa discussed in the text. In addition to the running glossary within chapters, a comprehensive glossary appears at the back of the book. The bibliography gives complete references for the suggested readings and also lists technical works referred to within the text. The index helps students access information quickly.
- *The text's visual appeal enhances its readability.* Detailed, colorful charts and drawings, as well as full-color photographs, underscore significant points in the text. Captions for the artwork add information rather than simply label the pictures.

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## NEW TO THIS EDITION

- Given the amount of new information—fossil finds, recalibrated dates, new hypotheses—about the origins of modern humans reported since the first edition, the controversy over this topic has become even harder to explain at the introductory level. This edition addresses that problem in two new chapters:

Chapter 11, “The Evolution of the Genus *Homo*,” covers the hominid fossil record from *Homo erectus* to modern *Homo sapiens*. For clarity of organization, Chapter 11 uses (but does not necessarily endorse) the currently most elaborate interpretation of the fossils—the recognition of six species: *H. erectus*, *ergaster*, *antecessor*, *heidelbergensis*, *neanderthalensis*, and *sapiens*. This does not ignore other interpretations that lump some of these species in various ways; these interpretations are covered within the chapter and in the next chapter. I just believe that this organization best facilitates the comparison of major models in Chapter 12.

In Chapter 12, “The Debate Over Modern Human Origins,” the two major models are presented and diagrammed, and the supporting predictions for each are listed. Each model is then discussed in light of current data from the fossil record, genetics, and evolutionary theory. An alternative model is presented and evaluated.

- Chapter 13, “The Study of Living Peoples,” continues to focus on bioanthropology applied to modern populations and individuals. It now includes a new section on “Disease and Human Populations,” which discusses evolutionary trends in the relationship between

human groups and diseases and contains what one reviewer called “frighteningly relevant” information on emerging diseases such as AIDS and mad cow disease.

- A “Contemporary Reflections” section at the end of each chapter poses a question that addresses a current topic or concern (for example, Does Science Dehumanize Society? Is It Really Possible to Clone Humans and Dinosaurs? Who Owns Old Bones? Are There Racial Differences in Athletic Ability?). The questions are addressed using specific material from the chapter. As one reviewer said, “The Contemporary Reflections answer many of the most often asked questions by students.”
- A section “Race and Modern Human Origins” is included in Chapter 12 to clarify the commonly expressed connection between those two topics.
- Chapter 3 includes an improved description of protein synthesis, Chapter 4 elaborates on the sickle cell anemia example, and Chapter 5 includes an expanded, more accurate discussion of the issue of gradualism v. punctuated equilibrium.
- Chapter 7 on primates now includes a discussion of cladistics and cladistic primate taxonomies.
- Chapter 8 contains updated information on baboon behavior and now includes a separate section on the behavior of the bonobos.
- Chapter 10 includes updated material on the evolution of the early primates, bipedalism, and the first Plio/Pleistocene hominids.

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## SUPPLEMENTARY MATERIAL

The **Instructor’s Manual** includes a test bank of about 500 multiple choice and short answer/essay questions, as well as chapter overviews, suggested activities, and lists of key words.

A **Computerized Test Bank** is available free of charge to qualifying adopters. It is a powerful, easy-to-use test generation system that provides all test items on computer disk for IBM-compatible or Macintosh computers. Instructors can select, add, or edit questions, randomize them, and print tests appropriate to their individual classes.

A set of **Color Transparencies** is also available for use on an overhead projector. Included are charts and diagrams from the text as well as several diagrams created just for classroom use.



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## ACKNOWLEDGMENTS

I must go back to the very beginning of my career and thank my first teachers in bioanthropology at Indiana University, Robert Meier and Paul Jamison, and the late Georg Neumann.

In the present, special thanks to my friend, colleague, and oftentimes co-author, Ken Feder. Not only has he been a help with this project, but he has, over more than twenty years, been a catalyst, if not a major element in much of my professional activity, particularly my writing.

And thanks, as always, to the folks at Mayfield, particularly sponsoring editor Jan Beatty (whose knowledge of both the publishing business and anthropology provides the holistic vision that makes such projects possible); production editor Melissa Kreischer (whose attention to all of the details made the production go smoothly); art manager Robin Mouat (who transformed my doodles into art); copyeditor Dale Anderson (who polished up some of my sentences and didn't edit out a small joke); and designer Anna George and design manager Susan Breitbard (who made the book so attractive and, therefore, more useful).

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# To the Reader

The broad field of biological (or physical) anthropology deals with everything from evolutionary theory to the human fossil record to the identification of human skeletal remains from crime scenes and accidents. A detailed account of this whole field would result in an unwieldy text that would be a tough assignment for a one-semester introductory course, especially if it were assigned in its entirety.

This text is intended to truly be an *introduction* to biological anthropology. It will tell you about the many different kinds of studies bioanthropologists participate in and how they conduct them; you'll also learn about the scientific theories and data they use. All the important aspects of bioanthropology are covered here but with just the essential amount of detail. When you understand an idea from this book, then you should be able to delve more deeply into the subject if you are interested and you will have the basis for an even more profound understanding.

A major theme of this book is the scientific method. Biological anthropology is a science, so an understanding of how science works is essential. Because the field of anthropology studies the human species in its entirety, however, the text will examine science as a human endeavor, seeing where it fits in the realm of human knowledge.

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## HOW TO USE THIS BOOK

Each chapter starts with an **introduction** that sets the stage and context for what's to come, followed by a series of **questions** that the chapter will answer. Because science proceeds by asking and answering questions, this format is also used within the body of the text. Important **terms** are in boldface and are defined in the margins at their first appearance. Each chapter ends with a **summary** that not only recaps the important points of the chapter, but also provides some new ideas and thoughts that help put what you have just learned into the context of the whole discipline of bioanthropology. A list of **suggested readings** made up mostly of non-

technical works tells you where to find more information if you are interested in a particular topic.

**A Glossary of Human and Nonhuman Primates** defines taxonomic (scientific) names for species discussed in the text—names like *Homo sapiens* and *Australopithecus afarensis*—and tells you how to pronounce them. In addition to the running glossary within chapters, a comprehensive main glossary appears at the back of the book. The bibliography gives complete references for the suggested readings and also lists technical works referred to within the text. The index will help you more quickly access information.







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