Preface

How Humans Evolved focuses on the processes that have shaped human evolution. This approach reflects our training and research interests. As anthropologists, we are interested in the evolutionary history of our own species, *Homo sapiens*. As evolutionary biologists, we study how evolution works. In this book, we integrate these two perspectives. We use current theoretical and empirical work in evolutionary theory, population genetics, and behavioral ecology to interpret human evolutionary history. We describe the changes that have occurred as the hominid lineage evolved and consider why these changes may have happened. While most physical anthropology textbooks focus on the "stones and bones" that paleontologists and archaeologists painstakingly excavate, we give life to the creatures that left these bones and made these artifacts, by focusing on the processes that generate change, create adaptations, and shape bodies and behavior. We also give serious attention to the role of evolution in shaping contemporary human behavior. There is considerable controversy about evolutionary approaches to human behavior within the social sciences, but we think it is essential to confront these issues openly and clearly. Positive responses to the first two editions of *How Humans Evolved* tell us that many of our colleagues endorse this approach.

One of the problems in writing a textbook about human evolution is that there is considerable debate on many topics. Evolutionary biologists disagree about how new species are formed and how they should be classified; primatologists argue about the adaptive significance of infanticide and the effects of dominance rank on reproductive performance; paleontologists disagree about the taxonomic relationship among early hominid species and the emergence of modern humans; and those who study modern humans disagree about the meaning and significance of race, the role of culture in shaping human behavior and psychology, the adaptive significance of senescence, and many other things. Sometimes multiple interpretations of the same data can be defended; in other cases, the facts seem contradictory. Textbook writers can handle this kind of uncertainty in two different ways. They can weigh the evidence, present the ideas that best fit the available evidence, and ignore the alternatives. Or they can present opposing ideas, evaluate the logic underlying each idea, and explain how existing data support each of the positions. We chose the second alternative, at the risk of complicating the text and frustrating readers looking for simple answers. We made this choice because we believe that it is essential for understanding how science works. Students need to see how theories are developed, how data are accumu-

lated, and how theory and data interact to shape our ideas about the way the world works. We hope that students remember this long after they have forgotten many of the facts that they will learn in this book.

New in the Third Edition

New developments in human evolutionary studies require regular updates in the textbook. As paleontologists continue to uncover new species and new sites and molecular geneticists provide new information about the relationships among hominid species, our understanding of human evolutionary history changes. While we made many changes throughout, readers familiar with the prior edition will find the most significant changes in Part II, Primate Ecology and Behavior, and in Part III, History of the Human Lineage. In chapter 5, we added a new section on Primate Conservation and a new Reading, "The Conservation of the Orangutan" by Delgado and van Schaik. We reorganized chapter 6, increasing coverage of primate sociality and moving some of the discussion of this topic from the old chapter 7 forward. In chapter 7, we added new sections on female reproductive performance among primates and on male reproductive tactics. In chapter 9, we added a new Reading, "What Do Chimpanzees Think about Seeing?" by Povinelli. We reorganized chapters 11, 12, and 13 for better coherence with the latest findings on hominid evolution. Chapter 11 is now about the apelike hominids. The reader will find new sections in this chapter on *Orrorin tugenensis* and *Kenyanthropus platyops* and a new Box on the recent "Toumaï" cranium, *Sahelanthropus tchadensis*. Chapter 12 now deals with what archaeology, theory, and analogy with contemporary apes and foragers allow us to infer about whoever made the Oldowan tools. We moved the information on tools to chapter 12. We reorganized chapter 13 to create new, separate discussions on *Homo ergaster* and *Homo erectus*. Chapter 13 is now focused on *Homo* and the transition to a more human life history with reduced dimorphism, slower development, parental care and the like. We added a new Reading to this chapter, "The Story of the First Missing Link" by Shipman about Eugene Dubois. In chapter 14, we discuss how new genetic sequence for entire mtDNA and new data on the Y chromosome and the non-recombining region of the X chromosome affect reconstructions of the origins of modern humans. We also added a new Reading to this chapter, "When Lions Ruled France" by Packer. We added a new discussion of the recently demonstrated relationship between the SLI and the FOXP2 gene to chapter 16. We updated the list of references for further reading and added a number of new study questions. With the help of our colleagues and copy editor, we also corrected a number of errors that found their way into the second edition.

We retained features that users of the book have found useful, such as the "key idea" statements marked in the margin with a small icon, and the discussion questions at the end of each chapter. We recommend that students use these key ideas to keep track of important concepts and facts and to structure their review of the material. Important, unfamiliar terms are set in bold type and defined in the text when they first appear. These terms can also be found in the glossary. The discussion questions that appear at the end of each chapter are meant to help students synthesize material presented in the text. Some of the questions are designed to help students review factual material, and others are intended to help students think about the processes or theoretical principles they have learned. Some questions are open-ended and meant

to encourage students to apply their own values and judgments to the material presented in the text. Students tell us that they find these questions useful in mastering the material and preparing for exams. The list of references for further reading at the end of each chapter provides a starting point for students who want to delve more deeply into the material covered in that chapter.

Each chapter of *How Humans Evolved* includes one Reading that is relevant to the material in the chapter. These readings are drawn from technical articles in scientific journals as well as more popular literature. The readings provide a more direct picture of how research is done. We include Boxes throughout the book in addition to the Readings. The Boxes amplify especially interesting details relevant to the surrounding text discussion. The reader will find a complete list of the Readings and Boxes in the table of contents.

Ancillary Materials

For instructors, there is an Instructor's Manual and Test-Item File prepared by Elizabeth Erhart of Southwest Texas State University, which includes a detailed outline of each chapter, answers to all of the discussion questions, and a bank of exam questions. The test questions are also available on diskette in MS-DOS and Macintosh formats, and will be provided free of charge upon adoption of this textbook. We also offer a Media Library of full-color transparencies of the figures and a CD containing many of the figures and photographs, for instructor use. This Media Library, available to adopting instructors, is especially rich as it offers images not only from *How Humans Evolved*, but also from two other fine and well illustrated books, Dean Falk's *Primate Diversity* and Glenn Conroy's *Primate Evolution*.

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Richard Klein provided us with many exceptional new drawings of fossils that appear in Part Three, an act of generosity that we deeply appreciate. We also give special thanks to Neville Agnew and the Getty Conservation Institute, which granted us permission to use images of the Laetoli conservation project.

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We also acknowledge the thousands of students and dozens of teaching assistants at UCLA who have used various versions of this material over the years. Student evaluations of the original lecture notes, the first draft of the text, and the first edition have been helpful as we revised and rewrote various sections. Our teaching assistants have helped us to identify many part of the text that needed to be clarified, corrected, or reconsidered.

We thank all the people at Norton who helped us to produce this book, particularly our excellent editor, John Byram. We thank Sarah Chamberlin for help in coordinating the new edition; Mary Babcock for copyediting expertise and Mary Kelly for project editing; and Elizabeth Erhart for preparing the revised Instructor's Manual.