



# PRINCIPLES OF ARCHAEOLOGY



T. DOUGLAS PRICE



# PRINCIPLES OF ARCHAEOLOGY

**T. Douglas Price** *University of Wisconsin-Madison*



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# This book is for Annalise Price

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# Preface

## SOME BACKGROUND

When I was nine years old, I was lucky enough to visit the remains of a massive Roman tomb along a roadside in northern Spain. Standing there, I was completely in awe of the crumbling walls of that ancient stone mausoleum; I wondered who made it, why it was built, and how old it was. My parents told me about the Romans and how archaeologists studied such ruins. I decided then and there that I wanted to be an archaeologist. That happened and I have been one now for many years. I love what I do. It is a wonderful job, filled with travel, fieldwork, discovery, ideas and intellectual challenges, interesting friends and quirky colleagues, demanding and delightful students, and endless ways to learn more about the past.

I would like to share this fascinating field with you. This book is written primarily to introduce college students to the ideas and methods of today's archaeology, where research in the field and laboratory combine to uncover our past. It's intended to tell you about this intriguing subject that combines so many disciplines and skills in the study of earlier human behavior. I hope that this book may encourage some of you to consider archaeology as a career and to enter this exciting field of study. If nothing else, I hope it will help you to better understand the world around you and to appreciate the inherent allure of the past.

There are generally two sorts of introductory courses in archaeology at our universities. One kind offers an overview of what archaeologists have learned about the past. These are world prehistory classes. There are several good textbooks for these overview courses. Gary Feinman and I have written one such introduction to world prehistory called *Images of the Past*. That book provides a survey of the human past from our earliest ancestors and the first use of stone tools through the development of art and more complex societies in the Upper Paleolithic, the origins and spread of agriculture, and the rise of early states in the Old and New Worlds. It's about facts and knowledge.

A second kind of course offers a consideration of the methods and ideas, or principles, of archaeology—about how archaeologists look at the past and how they obtain the information they use to make sense of the past. *Principles of Archaeology* is written for this kind of course about theories and techniques.

There are also several other textbooks available on this aspect of archaeology, but I think most of them are too complicated. It's not easy to write a straightforward book about the theories and techniques of archaeology because of the great diversity and breadth of the subject. Archaeologists do all kinds of things, including research, teaching,

public outreach, excavations, rescue work and cultural resource management, museum exhibitions, caring for monuments and parks, writing grant proposals—they even write books.

Archaeologists go in all sorts of directions to learn more about the past. The tools of modern archaeology are numerous and the areas of interest are myriad. That's one of the reasons it's so fascinating in the first place. However, there is so much involved in modern archaeology that one book simply cannot cover its entirety.

I have opted for a direct approach, focusing on fundamentals. I have included what I think is more important and more appealing, and I have incorporated the information that I think a first course in archaeology ought to cover. I have also described interesting sites and situations from both the New World and the Old that I feel serve as intriguing examples of methods and theories. At the same time, I have included some of the cutting-edge, breakthrough areas where science and technology are telling us new and exciting things about the past.

This is not a reference book. I have tried not to overload the text by covering all of archaeology, or hundreds of sites, or the full range of different methods or ideas that have appeared. For information on other aspects of archaeology, outside the scope of this text, I will point you toward suggested readings and websites. By having a text that covers the fundamentals, my hope is that you will be able to focus on what is essential. I will also try to point out why it's important to know certain things in the book. It's much easier to learn something if there is a reason for it!

## THE TEXT THEMES

There are several recurrent themes in *Principles of Archaeology*. The first concerns how archaeologists think and learn about the past. While it is important to master the methods and theories of archaeology, I believe that it is equally important for you to get a sense of how archaeologists think. This first theme is therefore intended to encourage you to reflect on the process of how archaeologists come to know the past. While this text presents a number of important methods and theories, my hope is that this book will allow you to go beyond a basic reading to being able to think for yourself. As part of this "thinking" theme, a number of the chapters include a final section where you can work on some fairly typical projects in archaeology, using method, data, and theory.

A second theme of the text, one I also feel strongly about, concerns the preservation of the past. I am not a tree hugger; I don't want to restore our local park to the ice

sheet, tundra, or oak forest that existed there at various times in the past. But I do know that archaeological sites are being destroyed at a rate much faster than they can be studied or saved as modern civilizations expand across the earth. Looting, careless development, and the wanton destruction of archaeological resources can eliminate any future opportunity to learn from our past. If we are to have archaeology in the coming decades, it is essential that fundamental information be recorded or protected before there is nothing left to be studied. For this reason, ways and means to save and protect archaeological sites are the second theme of this book. My goal is to encourage you to understand and help with the effort.

A third theme concerns the important role of science in archaeology. Scientific approaches to understanding the past are growing rapidly and are very important. Major discoveries in the future will come from the laboratory as much as from the ground. For this reason, students of archaeology need to learn about the possibilities and potential of the various laboratory and instrumental techniques that are employed in the study of the past. To this end, there is a separate chapter in this book on archaeometry, also known as “instrumental” archaeology. In addition, in a number of the other chapters, studies involving chemical and physical means of analysis are emphasized in the examples that are used.

## THE ORGANIZATION OF THE TEXT

Archaeology is not rocket science; it’s mostly common sense. Archaeologists collect information about the past, they study it, and they try to make sense of it. Archaeological materials are discovered and provide evidence of past human activities. This body of evidence must be analyzed in order to define basic facts such as age, use, location, and movement. Archaeologists have a powerful set of tools for investigating the evidence they discover. Evidence and the results of analysis provide a body of information about the past, but these are facts and estimates that must be interpreted to have meaning. Theories, hypotheses, ideas, and assumptions are bridging concepts that archaeologists use to interpret—to attach meaning—to evidence and analytical results.

Three stages—discovery, analysis, and interpretation—make up the heart of doing archaeology. This book is organized following these same basic steps to take you, the reader, along a path to learn

more about the human past. On the way, I will try to keep things simple, straightforward, and interesting. I think that makes them easier to learn.

This book has four parts. I have included an opening essay at the start of each part, which explains the subject and contents and which will help you get a sense of what is to come.

**Part 1** is an introduction in three chapters. These initial chapters are important because they provide background for the other sections, and they introduce significant themes that recur throughout the book.

Chapter 1 is an introduction to archaeology, about what it is and what it is not. It includes some discussion of the role of evolution and the scientific method, about why we should study archaeology, along with some information on careers so that you can see how many interesting opportunities there are in the field as you begin your study.

Chapter 2, “Doing Archaeology,” provides a lengthy description of the recovery and investigation of the royal graves at Sipán, Peru, some of the richest tombs ever found in the Americas. Through the story of Sipán, this chapter inaugurates the organization and themes of the book; with information on doing archaeological research (discovery, analysis, and interpretation), archaeological thinking, preserving the past, and science in archaeology.

Chapter 3 offers a brief history of archaeological research as a basis for understanding the discipline and its distinctive perspectives. This history provides a background for understanding how archaeology has developed over time and how archaeologists think about the past. This chapter could also be read in conjunction with Chapter 16 as an introduction to theory, ideas, and interpretation in archaeology.

The principles of archaeology comprise the next three parts of the book and the three stages of archaeological research. **Part 2** describes the *discovery* of archaeological information, including the questions that are asked (what archaeologists want to know) in Chapter 4, the archaeological record (the nature of the evidence) in Chapter 5, and the methods of fieldwork in Chapter 6.

**Part 3** concerns the various kinds of *analyses* that are done, assembled in a series of chapters dealing with the classification of the materials and statistics (Chapter 7), the dating of evidence (Chapter 8), geology and archaeology (Chapter 9), stone tools (Chapter 10), pottery (Chapter 11), animal bones (Chapter 12),

plant remains (Chapter 13), graves and human skeletal remains (Chapter 14), and the physical and chemical composition of archaeological materials (Chapter 15).

**Part 4** deals with *interpretation* and responsibility. Chapter 16 involves the theoretical ways in which archaeologists look at the past, where questions and ideas come from. The concluding Chapter 17 deals with the ethics and responsibilities of archaeology in today's world and offers more details on what can and is being done to protect the past and involve the public interest.

## THE FEATURES OF THE BOOK

The features in the text are designed to help you master the material and to highlight the themes. Learning is largely about recognizing what is important to remember, and I have incorporated both organizational and structural means for emphasizing what's of the essence in archaeology.

I have also taken a consistent approach to the format of the chapters in the book, beginning with a running narrative in each. This running text includes both the ideas and methods that comprise the basics of how archaeology is done. It is the heart of the book. Along with the running text, I have included three distinct sections called introductions, examples, and conclusions.

The *Introduction* provides an overview of the subject matter, themes, and organization of the chapter. In order to gain attention and draw you into the content of the chapter, the *Introduction* begins by focusing on a distinctive image that I hope conveys some of the fascination of the field. *Examples* are intermingled through each chapter. *Examples* are case studies from important archaeological investigations throughout the world to illustrate some of the concepts and methods that are described and to show how archaeologists think and work. I am a strong believer in learning by example, so there are numerous case studies, sometimes several to a chapter. The *Conclusions* synthesize the contents of the chapter and place that information in a larger context.

There are also three types of boxes sprinkled through the chapters that are intended to highlight the three themes. In the first kind of box, called *Archaeological Thinking*, I highlight situations where reason and ideas have resulted in new insight into past human behavior—where innovative thoughts have had important consequences. In the second box type, called *Protecting the Past*, I focus on what is or is not being done to protect some of the sites and places discussed in the text. This will give you some idea of the various problems and the solutions involved in preserving our common cultural heritage. The third kind of

box, *Science in Archaeology*, will emphasize studies in which instrumental and analytical techniques provide new information about the past.

Several other features support the first theme of encouraging you to think like an archaeologist. To this end, this book is problem-oriented; it is about the problems that archaeologists encounter and how they resolve them. Marginal quotes and several personal statements from archaeologists themselves allow you to hear the voices of the field and to learn how archaeologists themselves have thought about problems they have faced. So that you can get a personal sense of this process, I have also inserted a project section at the end of a number of the chapters with archaeological data or directions to involve you with a number of thought-provoking questions. These projects will be self-contained on perforated pages so that they can be removed. You can also find a digital version of these projects at the Student's Online Learning Center ([www.mhhe.com/pricearch1](http://www.mhhe.com/pricearch1)), which is discussed in detail later in this preface.

A few final features serve to help you learn more. Each chapter opens with an outline giving you a preview of what is to come. Technical terms and important concepts in archaeology are indicated in bold type in the text with definitions in the margins; all these words are also assembled in a glossary at the back of the book. Following foreign or unusual terms and names, I have included a pronunciation guide in parentheses. There is also an index at the back of the book to help you find names or topics quickly among the pages.

I have placed a few study questions at the end of each chapter to help you review the contents. A suggested list of general readings appears at the end of each chapter as well, while a more complete list of references sits at the back of the book. Specific citations within the written text were avoided in favor of a more readable prose, but references on specific topics can be found at the back of the book under the name of the individual associated with the work. You can also search this bibliography at the Online Learning Center by keyword.

Also at the back, you will find a brief summary of our human past in an appendix. In order to have some sense of the periods and places that you will encounter in this book, this section provides a whirlwind tour of prehistory with some timelines, major periods, general trends, and important sites. You may want to refer to this section for more information on some of the sites or time periods you encounter in the text.

In addition to these features, I have tried to provide a sense of the size of areas and structures from archaeological sites in the text by referring to modern features, such



as city blocks, football fields, and the like. An appendix in the back of the book offers some English-metric measure conversions and equivalents to help make sizes more comprehensible.

Because archaeology is a very visual subject, I have included lots of illustrations—some 500 photographs and drawings. Emphasis in the selection of these illustrations has been on quality and clarity. It is essential to see and study the maps, plans, artifacts, and places that comprise the archaeological record. Maps are shown with a small inset globe to provide better geographic orientation. Illustrations highlight the important features of a subject. Multi-step drawings and photographs explain more complex issues, such as making pottery. Cartoons are intended to provide a lighter look at the subject of archaeology. I have also included what are commonly called artist's reconstructions in a number of places through the book. These reconstructions are an attempt to depict what archaeological places may have looked like at the time they were in use. While these reconstructions are often inspiring, it is important to remember that they are highly speculative, based in part on archaeological knowledge and part on the artist's imagination.

An important note on dates: The age of archaeological materials is given in several ways in this book. Dates greater than 10,000 years ago are described in years before the present (bp) or in millions of years ago (m.y.a.). Dates younger than 10,000 years ago are given in calendar years before Christ, BC, or *anno Domini* ("in the year of the Lord"), AD. (Most archaeologists don't use the terms B.C.E. [Before the Common Era] or C.E.—the Common Era.) These dates for the last 10,000 years have been corrected, or calibrated to actual calendar years, because of a minor error in radiocarbon dating. Another term used for more recent periods of time is millennium, 1000 years. The millennia before Christ run in reverse—for example, the first millennium goes from 1 BC to 1000 BC.

## Supplements

As a full-service publisher of quality educational products, McGraw-Hill does much more than just sell textbooks. They create and publish an extensive array of print, video, and digital supplements for students and instructors. *Principles of Archaeology* boasts a comprehensive supplements package. Orders of new (versus used) textbooks help defray the

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## For the Student

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## Exciting Interactivity

- Internet exercises—offer chapter-related links to World Wide Web sites and activities for students to complete based on the sites.

## Useful Study Tools

- Chapter objectives, outlines, and summaries—are designed to give students signposts for understanding and recognizing key chapter content.
- Multiple choice and true/false questions—give students the opportunity to quiz themselves on chapter content and visuals.
- Essay questions—allow students to explore key chapter concepts through their own writing.
- Chapter key terms and glossary—define key terms.
- Audio glossary—helps students with words that are difficult to pronounce through audio pronunciation assistance.
- Bibliography—gives students the opportunity to search and explore topics of interest through additional readings on chapter-related topics.

## Helpful Links

- General Web links—offer chapter-by-chapter links for further research.

- Links to *New York Times* articles—give students immediate access to articles on chapter-related content.

### Useful Information

- FAQ's about Archaeology Careers in the United States—gives students answers to questions on available jobs, necessary education and training, picking a college or university, basic texts on the field, going on a dig, and getting more information.
- Career opportunities—offer students related links to useful information on careers in anthropology.

### For the Instructor

*The Instructor's Resource CD-ROM* (by Adam Wetsman). This indispensable, easy-to-use instructor disk provides a variety of features:

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- PowerPoint lecture slides—give professors ready-made, chapter-by-chapter presentation notes, including art from the text.
- Instructor's Manual—offers chapter outlines, chapter summaries, learning objectives, lecture-launcher ideas, and suggested films and videos.
- Computerized test bank—offers numerous multiple choice, short answer, and essay questions in an easy-to-use program that is available for both Windows and Macintosh computers.

*The Instructor's Online Learning Center* (by Adam Wetsman). This password-protected site offers:

- Access to all of the student online materials.
- Access to many of the instructor support materials found on *The Instructor's Resource CD-ROM*, including the Image Library, the PowerPoint lecture slides, and the Instructor's Manual.
- Links to professional resources—for anthropological sites on the World Wide Web.

*PageOut: The Course Website Development Center.* All online content for the text is supported by WebCT, Blackboard, eCollege.com, and other course management systems. Additionally, McGraw-Hill's PageOut service is

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*Videotapes.* A wide variety of full-length videotapes from the Films for the Humanities and Sciences series are available to adopters of the text.

## ACKNOWLEDGMENTS

Any book is a major undertaking—it's probably a good thing that authors don't remember that fact when they begin. A book also requires the efforts of numerous individuals in addition to the author. There are many people to thank, who have graciously provided their time, comments, information, and/or illustrations. Their help is both essential and greatly appreciated. This group includes Mark Aldenderfer, Søren Andersen, Eleni Asouti, Joe Ball, Ernie Boszhardt, Göran Burenhult, Elizabeth Burson, Jim Burton, Tom Christensen, Christiane Clados, Meg Conkey, Lawrence Conyers, Bernd Cromer, Erwin Czesla, Marie Danforth, Andrew Elkerton, Gary Feinman, Dave Frederick, Paul Goldberg, Bill Green, Paul Green, Peter Vemming Hansen, Sönke Hartz, Brian Hayden, Barbara Heath, Clara Helfferich, Ian Hodder, Kasper Johansen, Greg Johnson, Annie Katzenberg, John Kelly, Lucretia Kelly, Doug Kennett, Mark Kenoyer, Jason Krantz, Kelly Knudson, Dan Lieberman, Linda Manzanilla, Joyce Marcus, Mark Michel, William Middleton, George Milner, Paul Mullins, Wes Niewoehner, Christopher O'Brien, Inger Österholm, Duane Peter, Nicole Pigeot, Kathleen Pigg, Tom Pleger, Jennifer Price, Karen Rehm, John Rick, Larry Ross, Matt Sanger, Sissel Schroeder, Tom Server, Payson Sheets, Bruce Smith, James Stoltman, David Hurst Thomas, Ruth Tringham, Clive Waddington, Christian Wells, Robert Whallon, Barbara Winter, Henry Wright, and Jason Yaeger. Special thanks to Joe Ball, Rhonda Foster, Paul Green, Maureen Kavanagh, Larry Ross, Tina Thurston, and Anne Underhill for their personal sections. Dale Croes made an important contribution to the "Responsibilities" chapter, as he does to the field as a whole. Also loads of thanks to Adam Wetsman, who has done so much fine work on the teaching supplements for the book.

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## CONCLUSION

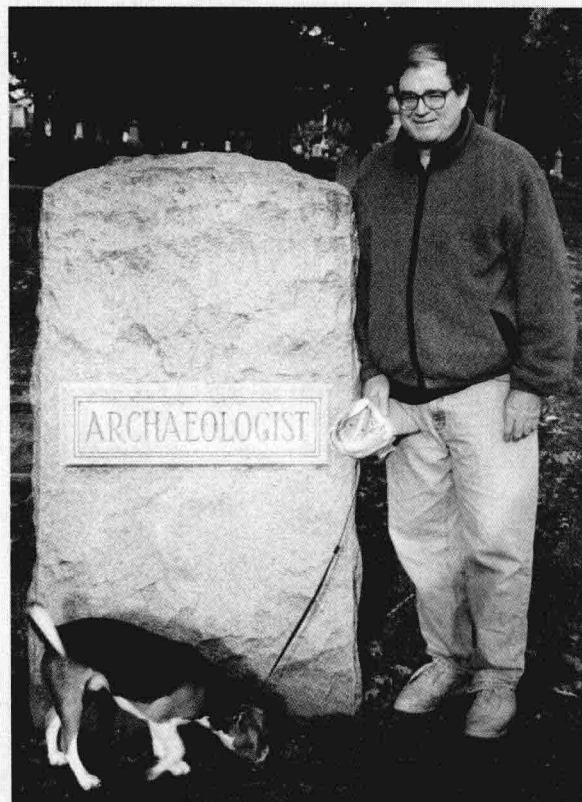
I have written this book for a variety of reasons. Archaeology is an inherently intriguing subject to many people. I find it fascinating. I believe that archaeology provides an important part of human knowledge. It helps us understand ourselves, where we have come from, what we have experienced, how we have survived, and even where we may be going. Enrollment in archaeology courses in colleges and universities continues to grow. Media coverage of new discoveries and interpretations appears almost daily. In order to understand this subject better and to put it into the context of our lives today, it is important to know about how archaeology works and how archaeologists think about the past.

It is my hope that this book, *Principles of Archaeology*, will help you understand what it is that archaeologists do. Perhaps it will help you decide to become an archaeologist or to be a better one. I hope that the path here through discovery, analysis, and interpretation will be smooth, and that you will enjoy the journey. If you have any suggestions about how to improve this book, I would be happy to hear from you.

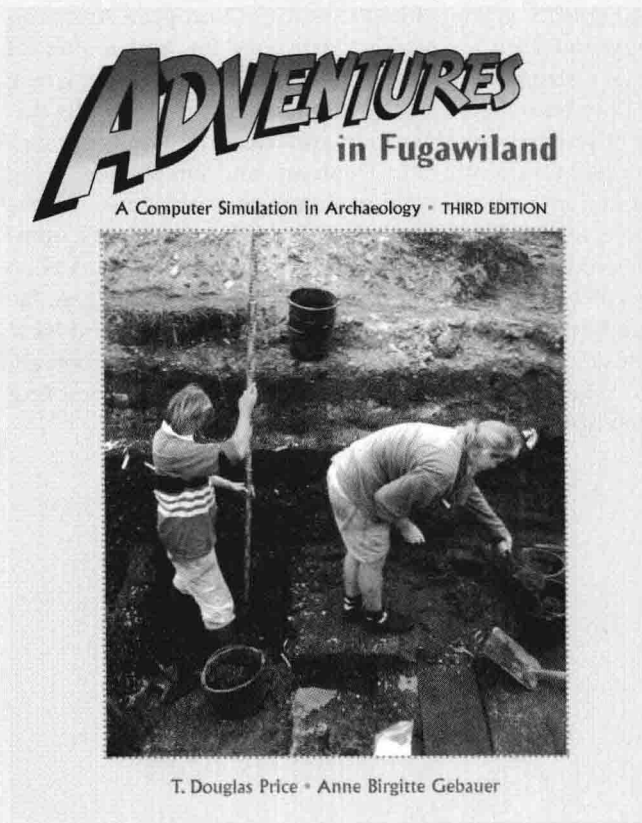
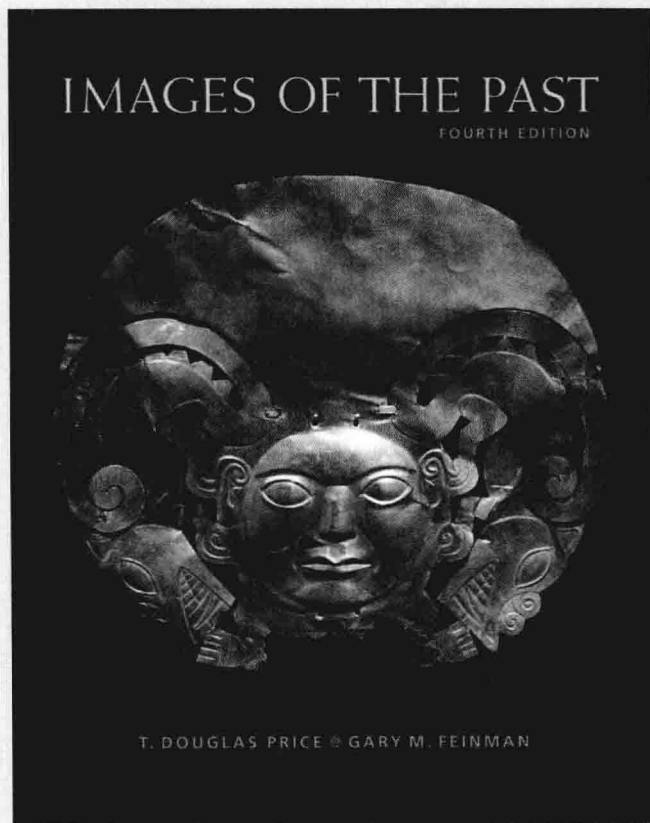
—T. Douglas Price  
Madison  
December 2005

# About the Author

Doug Price is Weinstein Professor of European Archaeology and Director of the Laboratory for Archaeological Chemistry at the University of Wisconsin-Madison, where he has been on the faculty for more than 30 years. His current research involves fieldwork dealing with the beginnings of agriculture in Denmark and lab studies using strontium isotopes in human tooth enamel to look at questions of prehistoric migration. He is the author of a number of books and articles on archaeology and has been involved in fieldwork in Ireland, Wisconsin, Michigan, the Netherlands, Peru, Israel, Guatemala, Mexico, and New Mexico. He likes archaeology, children, cooking, football, and the family dog. He doesn't like long, self-promoting descriptions of a book's author.



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# Offering a Unique Approach to Introducing Students to Archaeology

The first major theme of the text concerns how archaeologists think and learn about the past and offers students multiple examples and opportunities to explore archaeology using method, data, and theory on their own.

A second major theme of the text concerns the ways and means to save and protect archaeological sites and encourages students to help with the effort.

The third and last major theme of the text illustrates the importance of the laboratory and instrumental techniques in archaeology and conveys the changing nature of the discipline.

Remains of these three populations and a brown bear have been given the scientific name *Ursus arctos* in recognition of their position in the brown bear group. At present, it is not clear how they were separated by the spread. Genetic research for this week in Turkey, Lebanon, Cyprus, and North Africa's Euphrates valley, if it shows significant genetic differences between the three groups, will help to clarify the evolutionary relationships between the three groups. The genetic analysis provides a new picture of the spread of the brown bear from the Middle East to the North Atlantic, but it is not clear how the spread occurred. It may have occurred more recently than thought. The evidence suggests that the brown bear was present in the region as late as the early 19th century of the last Ice Age. The spread of the brown bear from the Middle East to the North Atlantic is not clear. The spread of the brown bear from the Middle East to the North Atlantic is not clear. The spread of the brown bear from the Middle East to the North Atlantic is not clear.

#### MICROBOTANICAL REMAINS

386 Chapter 10: Antisymmetry

Fig. 13.29. 25-megapixel resolution, a view of the summit of Mount Fuji.

प्रतिष्ठा - "I have faith in you and in the world."  
 श्रद्धा - "I have faith in you and in the world."  
 विश्वास - "I have faith in you and in the world."  
 विश्वास - "I have faith in you and in the world."  
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36 *Journal of Management Inquiry* 16(1)

## 418







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Figure 11.2 Selection of bone fragments from a site in Peru. Some of the fragments are identified as human remains. The fragments are used to illustrate the complexity of archaeological interpretation.

# Brief Contents

Preface	xix
About the Author	xxv
Walkthrough	xxvii



<b>PART 1 INTRODUCTION</b>	<b>1</b>
CHAPTER 1 An Introduction to Archaeology	3
CHAPTER 2 Doing Archaeology	29
CHAPTER 3 A Brief History of Archaeology	47



<b>PART 2 DISCOVERY</b>	<b>67</b>
CHAPTER 4 Archaeological Questions	69
CHAPTER 5 The Archaeological Record	101
CHAPTER 6 Fieldwork	141



<b>PART 3 ANALYSIS</b>	<b>177</b>
CHAPTER 7 Classification and Data	179
CHAPTER 8 Dating	215
CHAPTER 9 Geoarchaeology	245
CHAPTER 10 Lithic Analysis	271
CHAPTER 11 Ceramic Analysis	297
CHAPTER 12 Archaeozoology	323
CHAPTER 13 Archaeobotany	349
CHAPTER 14 Bioarchaeology	377
CHAPTER 15 Archaeometry	415



<b>PART 4 INTERPRETATION</b>	<b>445</b>
CHAPTER 16 Explanation in Archaeology	447
CHAPTER 17 Responsibilities	477

<b>APPENDIX 1 A Brief History of the Human Past</b>	<b>A-1</b>
<b>APPENDIX 2 Common Measurement Conversions and Equivalents</b>	<b>A-24</b>

Glossary	G-1
Bibliography	B-1
Credits	C-1
Index	I-1