Fourth Edition

THE HUMAN PAST

World Prehistory & the Development of Human Societies

Edited by Chris Scarre

Thames & Hudson

the human past

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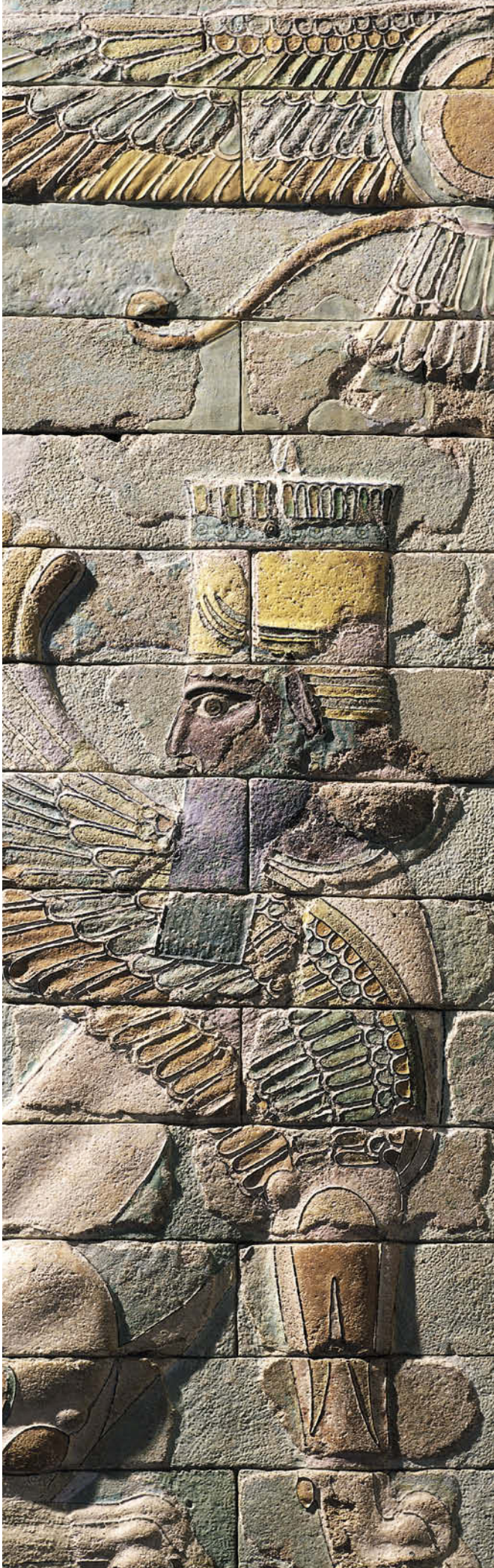
764 illustrations

FOURTH EDITION



Thames & Hudson

On the cover Upper part of a Nok terracotta of a male figure from Pangwari E., Nigeria, excavated in 2013. Courtesy Institute for Archaeological Sciences, Goethe University Frankfurt.

Half-title Hopi Manawgya Kachina doll. Museum of Northern Arizona, Flagstaff.

Title page Frieze from the Palace of Darius I at Susa, Iran. Fifth century BCE. Musée du Louvre, Paris.

Acknowledgments

I should like, first and foremost, to acknowledge the individual contributors to this volume, who once again have provided an excellent series of texts and have patiently responded to a seemingly endless sequence of questions and comments. The success of *The Human Past* is testimony to this teamwork. My thanks go to them also for their co-operation, inspiration, and dedication in revising and updating their respective chapters. In preparing this new edition it is my pleasant duty also to record my gratitude to the new team at Thames & Hudson for their support and professionalism. Last but not least, I owe a large vote of thanks to my colleagues at Durham for their knowledge and advice, and for providing a lively and stimulating academic environment.

First published in 2005 in paperback in the United States of America by Thames & Hudson Inc., 500 Fifth Avenue, New York, New York 10110

thamesandhudsonusa.com

Fourth edition 2018

Library of Congress Control Number 2017955795

ISBN 978-0-500-29335-5

Printed and bound in China by C&C Offset Printing Co. Ltd.

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PREFACE

Chris Scarre

When we apply for a driving license or a passport, we interact as citizens with a complex structure of government and administration through which nation states function. When we buy food at the supermarket, we are the last link in a complicated organization that grows and ships food around the world to meet our needs. But our ancestors 20,000 years ago did not have access to government agencies nor to organized systems of food production and the many other things we take for granted in modern society. They lived in small groups, made their own clothing and tools, and found their own food. It is only by understanding our past that we can hope to grasp how the world—and human society—has come to be as it is today: a network of states and cities, societies and individuals, underpinned by beliefs, knowledge, and traditions. Historical records take us back only so far—indeed in many parts of the world, little more than a few centuries. The human past is much longer, richer, and more diverse, stretching back 3 million years or so to our early tool-making ancestors on the African savanna. How humans colonized the rest of the world, how farming came to support larger and more complex societies, how the first cities and states arose, and how a diverse mosaic of cultures came to populate the habitable world, is the story told by archaeology.

The aim of this volume is to provide an authoritative guide to those 3 million years, in a way that is accessible both to beginning students in archaeology and anthropology and to any interested reader; the book assumes no prior knowledge of the field of prehistory. Today, in the twenty-first century, new technologies and discoveries, as well as the increasing scale of archaeological research, are allowing us to see the patterns of the human past in fuller outline and in greater detail than ever before. What archaeologists have long sought to achieve—to construct a truly worldwide picture of the development of human societies, in all their diversity and across enormous spans of time—we are now able to do with new confidence.

The growing pace of archaeological research is reflected in the development of university and college courses, and that, in turn, has triggered the production of several textbooks on world prehistory. Many seek to cover the entire field of the human past under the pen of a single author. These are valiant undertakings, increasingly so in an age when the rate of archaeological publication has reached levels that make it difficult even for regional specialists to keep up with new work in their own area. *The Human Past*, diversely, is a multi-authored text, with each chapter the work of an acknowledged expert in his or her field.

Our twenty-four authors are drawn from North America, Britain, Australia, and New Zealand. Specializations range from the first stone tools made by early hominins in Africa, to the complex societies of such disparate cultures as those of the Romans, Polynesians, and Aztecs. Together these scholars cover the vast panorama of the human past with a level of detailed understanding and expertise that is unrivaled in any other textbook of world prehistory. *The Human Past* thus has an authority that is beyond the reach of any single-authored work: the texts are based on first-hand knowledge of the areas and issues under discussion, and represent an accessible, up-to-date, and uniquely reliable account of what we know today about the origins and development of human society.

New in this Edition

The study of world prehistory is a rapidly moving field with new discoveries reported weekly in the news and on television. Some of these are spectacular, others profound in their consequences for the understanding of how human societies have developed—that is to say, how we come to be who we are today.

This new fourth edition of *The Human Past* incorporates these advances in knowledge, building on the three previous editions. Major revisions for this edition include:

- Streamlined and updated chapter text;
- Thoroughly revised design, illustration program, and timelines;
- A brand-new chapter, Chapter 5 "The Origins, Antiquity, and Dispersal of the First Americans," written by David J. Meltzer;
- Archaeological methods assembled together in Chapter 1;
- New Key Themes boxes throughout the book, which focus attention on five common issues in human history: **climate change**, **domestication**, **migration**, **social inequality**, and **urbanism**.

This represents the third comprehensive revision of our original book, and each member of our international team of authors has played a central and active part in reviewing and rewriting their own chapters and sections. Their input ensures that *The Human Past* continues to be a leading textbook of world prehistory, and the most authoritative and up-to-date account available of the development of human societies from early hominins to states and empires.

New discoveries continue to open fascinating windows on the past, and to alter and improve our understanding of early human societies. The most important of them are given box feature treatment in this new edition. They include the hominin fossils found in Dinaledi Cave in South Africa (Chapter 3) suggesting a new species, *Homo naledi*; signs of administration and the impact of agriculture in the Neolithic farming villages of Tell Sabi Abyad I in Northern Syria (Chapter 7) and Jiahu in China (Chapter 8); evidence for the movement of southern Chinese rice farmers into Vietnam at the important site of Man Bac (Chapter 8); and the surprising location for an urban settlement at

Old Jarma, in the Libyan Sahara (Chapter 11). These discoveries are not only important in themselves, but also have significance for our broader understanding of social and cultural change and interaction.

Some of the most important recent advances have come from the application of scientific techniques to archaeological questions, and in particular the analysis of ancient DNA extracted from human and animal remains. Chapter 5, the new chapter on the peopling of the Americas, explains how only in the last decade has technology enabled us to map modern and ancient genomes, and how this has been used to reveal details about the ancestry of the first Native Americans; we also report on new genetic evidence for the migration of the Yamnaya people from the Eurasian steppes into Eastern and Central Europe (Chapter 12); and we learn how new mitochondrial DNA analysis is impacting hypotheses about Austronesian dispersal (Chapter 9).

These new discoveries and insights should not blind us to the fact that archaeology draws upon the emotive material of cultural heritage. Growing pressure on world resources constitutes a major threat to the archaeological heritage. Conflict and poverty exacerbate the problem, as in Iraq where instability following the Iraq War in 2003 led to widespread looting of archaeological sites. Involving local communities in their own archaeology is a crucial step in reconnecting people to their own heritage. Indigenous archaeologists are increasingly playing a prominent part in exploring and developing archaeological programmes and perspectives. The picture of the human past that we present in this fourth edition is the fruit of new research in the laboratory and in the field, but is inspired by the firm belief that by understanding world prehistory, we gain a fuller and richer understanding of ourselves, and of the diversity of human experience past and present.

Organization of the Book

The volume is divided into two main sections. Part I (Chapters 2–5) focuses on human origins and developments up to the end of the last Ice Age—the period conventionally known as the Paleolithic. The second, longer, section (Part II, Chapters 6–19) covers the postglacial period, the Holocene, from 11,600 years ago to recent times.

The book begins with an introduction (**Chapter 1**) that presents and explains a number of key concepts: what the disciplines of archaeology and prehistory comprise and how they originated; the ways in which archaeologists seek to learn about the human past (methods and techniques); and how they attempt to interpret archaeological remains in order to understand how societies have developed and changed (archaeological theory). The next four chapters cover the Paleolithic period, beginning in **Chapter 2** with hominin origins in Africa. **Chapter 3** describes the dispersal of early humans across much of the Old World and the development of new species of the human lineage, new lifestyles, and new technologies. **Chapter 4** covers the emergence and spread of fully modern humans; and **Chapter 5** is a new chapter, exploring the first peopling and early prehistory of the Americas. **Chapter 6** prefaces the second section of the book, setting out the main themes of the postglacial period around the world: climate change; the origins of farming; the inexorable rise in human population density; and the development of the social complexity that underpinned the emergence of cities and states. These themes are highlighted in the region-by-region chapters that follow.

The arrangement of material both within and between chapters is broadly chronological. **Chapters 7–15** take the reader on a world tour of Holocene developments, beginning in Southwest Asia and proceeding via East Asia, Australasia, and the Americas to Africa, Europe, and South Asia. The adjustment of human societies to postglacial environments, and the development of the new food-producing economies, provides a unifying theme across these chapters. The development of complex societies is also described: in Africa (**Chapter 11**), Southwest Asia (**Chapter 13**), the Mediterranean lands (**Chapter 14**), and South Asia (**Chapter 15**). More recent centuries are covered in **Chapters 16–19**, which describe regional developments in East Asia and particularly in the New World.

This book provides a comprehensive introduction to world prehistory, and could form the basis of a complete undergraduate program. It could also be used more selectively, by taking a series of chapters to explore a particular theme or region. Thus Chapters 5, 10, and 17–19 provide an account of American prehistory from the Paleoindians to European colonization; alternatively, a comparative study of state societies might draw on Chapters 13, 15, 17, and 18 for a selection of Old and New World examples (Mesopotamia, the Indus Valley, Mesoamerica, and Andean South America).

Within a multi-authored work of this kind there is necessarily less scope for a personal perspective, but the book is given coherence by its focus on key themes of climate change, domestication, migration, social inequality, and urbanism. The final chapter brings these themes together in a brief retrospective that also looks to the lessons of the human past for the human future, in particular in terms of climate change and demographic growth. These form, arguably, the most important message that archaeology offers to the present world, though their implications are all too rarely taken seriously by planners and politicians. For the story of human evolution is not just about our past; it is intensely relevant to the most burning issues of contemporary humankind.

Our final image, the calving of an enormous iceberg from the end of the Petermann glacier in Greenland in 2010 [**20.4**], graphically illustrates the constantly changing environment in which we live. It is particularly timely since a similarly huge iceberg has recently broken away from the Larsen ice shelf in Antarctica, fuelling concerns about global warming. As archaeology reveals, climatic and environmental change have been the backdrop to the development of humans and human society over the past 3 million years, providing both challenges and opportunities. Yet archaeology is also about the small scale, about the lives and circumstances of ordinary individuals across a huge kaleidoscope of times and places.

Special Features

The specialist scholarship of *The Human Past* is supported by a series of features that make the book accessible to the widest variety of readers:

Methods and Techniques. New for this edition, Chapter 1 introduces some of today's most important scientific techniques used to date archaeological remains and to reconstruct ancient environments, including such current technologies as GIS and LiDAR survey, and the study of ancient DNA.

Timelines. Located at the beginning of each chapter and newly designed in full color for this edition, timelines allow students easily to identify the periods, peoples, events, sites, and artifacts for the area under discussion, and the chronological terminology commonly employed in each region ("Formative," "Neolithic," etc.).

Maps and Diagrams. Each chapter is accompanied by a map showing the location of major sites and regional or cultural groupings. Additional maps and a wealth of plans, diagrams, and photographs illustrate specific themes or processes. Archaeology is an extremely visual subject, a fact that the high level of illustration in this volume serves to underscore.

Box Features. Highlighted in each chapter, these fall into four categories: "Key Sites," "Key Controversies," Key Discoveries," and, new for this edition, "Key Themes." "Key Sites" describe important individual sites or finds in greater detail than is possible within the main text. "Key Controversies" supplement the chapter texts by focusing on such important areas of debate as the evolution of language, the domestication of maize, or the origins of African ironworking. "Key Discoveries" include discussions of breakthroughs in long-standing archaeological enquiries, for example the origins of Chinese writing or the Mesoamerican ball game, as well as descriptions of such world-famous discoveries as the Chinchorro mummies of Chile, representing the world's earliest deliberate mummification, and of the Alpine "Iceman" popularly known as "Ötzi." "Key Theme" boxes are introduced in Chapter 1, and appear in every chapter. Written by the authors, the themes link global regions and highlight issues still of critical relevance at the present day, the subject of each box belonging to one of five topics: Climate Change, Domestication, Migration, Social Inequality, and Urbanism.

Summaries. Provided at the end of each chapter, these give an overview of the chapter contents and reiterate the main conclusions. Links between chapters are indicated, making it easy to follow the developments of a particular region from their earliest appearance to later complexity.

Further Reading and References. Each chapter closes with suggestions for further reading: carefully selected titles that will enable students to amplify and deepen their understanding of the key themes of that chapter. Full information for publications cited in each chapter is provided in the chapter-by-chapter References at the end of the volume.

Suggested Websites. A list of recommended websites, chosen for particular usefulness, clarity, and scholarly reliability, is provided at the end of chapters where appropriate.

Glossary. As far as possible, specialist terms are explained where they first appear in the book; in addition, a glossary is provided at the end of the volume for easy reference. Glossary terms are emboldened at first mention in the book; bold text is also used to draw attention to key sites within each chapter.

Student and Instructor Resources

A website has been designed to accompany *The Human Past*, Fourth Edition, offering students a range of materials to reinforce what they have learned from *The Human Past* and to help them prepare for tests: http://college.thamesandhudsonusa.com/college/humanpast4

The following are provided for each chapter: chapter summaries and key concepts; practice quizzes; glossary; web links; and flash cards to revise key terms. For this edition we have also prepared a test bank of questions that instructors can customize for tests and exams, and images and diagrams (as JPEGs and as captioned PowerPoint slides) for use in class; we have also provided a selection of videos: http://college.thamesandhudsonusa.com/college/humanpast4

Readers outside North America should email education@thameshudson.co.uk for further information.

The Human Past, Fourth Edition is also available as an e-book. Visit nortonebooks.com for more information.

A Note on Dating

For the Paleolithic period (Chapters 2–5) dates are given as "years ago" (years before the present). The other dates used in this volume have wherever possible been converted to calendar years (BCE/CE). For an explanation of calibration and radiocarbon dating, see p. 31.

Reviewers

In preparing this fourth edition of the book, we benefited from feedback from Marcia-Anne Dobres, University of Maine; Tina Greenfield and Haskel Greenfield at The University of Winnipeg; and Marissa Wojcinski, The University of North Carolina at Chapel Hill. Thanks should also go to reviewers of previous editions of *The Human Past*.

1 INTRODUCTION: THE STUDY OF THE HUMAN PAST

Chris Scarre, Durham University

Colossal statue of an Egyptian pharaoh discovered at Heliopolis in eastern Cairo in March 2017. It was originally thought to represent Ramses II, a famous ruler of the thirteenth century BCE, but a **hieroglyphic** inscription on the back bears the name of Psamtik I, an important pharaoh of the seventh century BCE.

Modern humans (*Homo sapiens*) have been living on the Earth for 200,000 years or more, an immense span of time when compared with the normal compass of human experience. Human ancestors go back even further, to the earliest so-called hominins of Africa 6 million years ago, or to the first of those who made stone tools, *c*. 2.5 million years ago. Archaeology, by contrast, is a young subject.

Far from being secondary to history, archaeology is our main source of knowledge for the human past, covering literate and non-literate peoples alike. It is the only field of enquiry that allows the broad canvas of the human story to be viewed as a whole. It illustrates the full diversity of human culture and society and shows how humans have changed and adapted, both to such external factors as climate and environment, and to new social circumstances and technologies. It reveals the degree to which humans have created themselves, in the form of culture and innovation, and it studies how they coped with the demands of subsistence and technology. These factors remain pertinent today, and a study of prehistory gives us a unique opportunity to examine such processes using a long-term perspective. Before exploring the range of prehistoric societies that make up our shared history, this first chapter introduces how we have been able to reconstruct world prehistory through the various methods and theories of archaeology.

What Is Archaeology?

Archaeology can be defined as the study of the human past from material remains. It is often considered (especially in North America) as a sub-field within the discipline of **anthropology**. Anthropology—the study of humans—includes a number of other sub-fields:

- **Cultural anthropology** (or social anthropology), the study of the diversity of living societies, often based on the work of ethnographers who live for a time within those societies and observe their behavior at first hand. For example, a cultural anthropologist may study the lives of the !Kung in Namibia or the Dogon in Mali. Cultural anthropology has enriched our understanding of the diversity of human communities. Traditionally, ethnographers have focused on non-Western societies, but increasingly today they are turning their attention to specific groups within Western societies, for example immigrant communities or inner-city groups.

- **Biological anthropology**, the study of human evolution and physiology. Biological anthropology includes the study of fossil and skeletal remains of early humans, which feature predominently in Chapters 2–4. It also includes human adaptation to environment and disease, including patterns of nutrition, fertility, and genetics.

- **Linguistic anthropology**, the study of world languages, their development, and interrelationships. Studying the relationships between languages can offer valuable insights into how peoples have traveled across the globe, or interacted with each other. We will find excellent examples of this in the case of the Polynesians in Chapter 9.

Archaeology is the fourth of these sub-fields of anthropology. It is famous for such exceptional discoveries as the "royal" tombs of Sipán in Peru (Chapter 18) or Qin Shi Huangdi's pottery army in China (Chapter 16) [**1.1**]; these catch the headlines but are only one small element of the story that archaeology tells us about the human past. What we can learn about the details of daily life is often equally intriguing and arguably more significant. One of the greatest advantages of archaeology is that it deals with the rich and poor, literate and illiterate, the ordinary and the exceptional, dependent simply on the survival of evidence and the attentions of archaeologists themselves. The result is a rich and insightful account of human history.

1.1 Terracotta army. Discovered by accident in 1974, the army of life-size terracotta warriors at Xian in China was intended to protect the tomb of the first emperor, Qin Shi Huangdi. Pit 1, shown here, contained 3,210 armored infantrymen, while a second pit held 1,400 cavalry, chariots, and crossbowmen.

1.2 The Churning of the Sea of Milk, from the eastern gallery of the twelfth-century temple-mausoleum of Angkor Wat in Cambodia. The scene is taken from the Hindu creation myth and depicts gods and demons pulling on the body of a giant snake in order to churn the cosmic sea and release the elixir of immortality.

In terms of **chronology**, many consider that archaeology begins when early **hominins** first began to create material culture (stone tools) some 2.5 million years ago (Chapter 2). Material culture is often presented as one of the hallmarks of humanness; several other **species** use found objects (e.g., twigs or stones) to probe for food or to break open nuts, but none manufactures tools on a regular basis. The reliance on material culture, on tools, is hence distinctively human, and has given humans a substantial advantage in coping with a wide range of environments. Without key items of material culture (e.g., clothing and shelter) humans would still be restricted in distribution to the tropical regions, where our closest primate relations, the gorillas and chimpanzees, live today. It is material culture that has allowed humans to populate the globe, and to develop large and complex settlements and societies. Material culture also makes humans what we are today: we are in many respects the product of the material world we have created. Thus, in a real sense, the rudimentary stone tools made in Africa 2.5 million years ago were a vital step in enabling the development of human potential, the results of which we see around us in the twenty-first century.

But archaeology is not just about technology. The material remains form part of the broader category of human culture that also includes such non-material traces as oral literature, dance, song, belief, myth, and ritual practices. And the remains of material culture are also rich in evidence about the social, economic, symbolic, and religious life of past human societies: what we might call the human experience. Recent decades have seen a growth of interest in **cognitive archaeology**—the study of religious and symbolic behavior and of the development of the human mind. Powerful structures of belief and understanding underpin the ways in which humans comprehend the world, and these are frequently manifest in imagery or traces of ritual practice. Carvings and figurines may provide direct representations of mythical beings and religious ceremonies [**1.2**]. Scenes in Egyptian temples and tombs, for example, show deities weighing the souls of the dead, while Angkor temples (Chapter 16) depict elements of the Khmer pantheon.

Burials, the ways in which people have disposed of their dead, indicate a growing concern with identity and the afterlife across the millennia. The occasional burials of the Middle and Upper Paleolithic testify to the origins of human feelings of respect in the treatment of the dead. In more recent periods, the deceased may be inhumed (buried) or cremated, and equipped (sometimes lavishly) with objects and furnishings to assist life in the afterworld, or the journey there. The living, too, may be represented in statuary and art, throwing light on social practices and political power. Popular beliefs and household rituals are as much a part of archaeology's domain as the lavish stage-managed cults of **state**-sponsored temples and priesthoods.

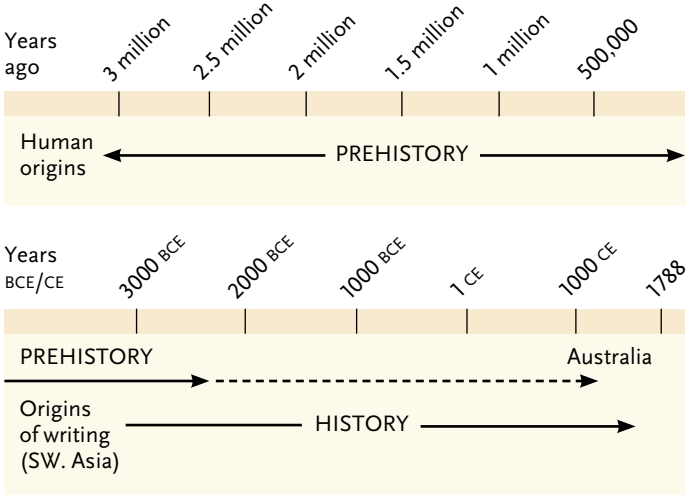
Prehistory vs. History

Archaeology has, in chronological terms, no upper limit. It does not end with Columbus's expedition to the Americas in 1492, nor with the Industrial Revolution in the eighteenth and nineteenth centuries. It is not a method exclusively for the study of the *early* human story, but of the *whole* of the human past. It can as well be applied to contemporary societies as to those of distant

millennia, and to industrialized societies as much as to developing, non-Western ones. Indeed, one particularly flourishing sub-field of the subject is devoted to industrial archaeology—the archaeology of the Industrial Revolution and later, focusing not only on factories and machines, but also on the housing and living conditions of ordinary families of the time. There have also been a number of projects on the archaeology of modern Western society, one example being the Arizona garbage project, which studied the contents of domestic trash cans from Tucson, Arizona (Rathje and Murphy 1992). More recent still is the archaeological analysis of the twentieth-century Jodrell Bank radio telescope in the UK (Edmonds 2010).

If archaeology is essentially an approach to human societies based on the study of material culture, there is nonetheless an important distinction to be drawn between historic and prehistoric archaeology. History is the study of the human past from written records (or from recorded oral traditions). Since writing was first invented less than 5,500 years ago in Southwest Asia, the whole of the human story before that time falls within the period of **prehistory** [**1.3**]. As writing, however, was adopted at different times in different places, so the transition from prehistoric to historic (text-based) archaeology (Little 1992) occurs at diverse stages. In western Europe, for example, history proper begins with the Greeks and Romans in the south, and with the Middle Ages in the north. This transition is sometimes further complicated by a shadowy protohistoric period; here, archaeology continues to provide the primary source of information for those early societies where writing was known, but used only for limited purposes.

1.3 Prehistoric and historical archaeology. Writing was invented in Southwest Asia around 5,500 years ago; prehistory, the period before written records, covers a vast time span, for which material remains form our only evidence. Because writing was adopted at different times around the world, the transition from prehistory to history also varies.



The Relevance of World Archaeology

We live today in a global age, when all cities and regions of the world are bound together, and where cultures and ideologies meet in diverse, multi-ethnic societies. Yet there is still a profound ignorance about the more remote segments of the human story, those lying furthest back in time or in regions that have been relatively little explored. This is all the more surprising given the public interest in ancient sites and remains; many Europeans and North Americans, for example, now combine a few weeks on a beach with a visit to Maya ruins or Mycenaean citadels.

Archaeology, too, is global in scope, telling us about both literate and non-literate societies, redressing the imbalance of a document-based history. Striking examples of this can be found in Australia and southern Africa, both areas without any written historical record prior to the arrival of the Europeans, and where archaeology now demonstrates a rich prehistoric past.

The study of world prehistory also encourages us to view human development in long-term perspective. This can be seen most obviously in the early stages of human evolution, where the gradual expansion in human settlement and the ability to cope with varied and changing environments are major themes. The broad perspective of prehistory presents a similarly long-term view of human interaction with the environment, and allows us to pose key questions about the origins of agriculture, the development of cities, and various other phenomena that emerged, apparently independently, in different parts of the world. This perspective is all the more important since it was agriculture that laid the foundation of the complex societies, the urbanization, and states that have been a prominent feature of recent centuries.

Thus, world prehistory is both enlightening and empowering. It is enlightening in that it offers a broad perspective, enabling local and regional developments to be better understood. It also allows events and circumstances in the recent past or at the present day to be set within the context of human developments stretching back over hundreds or thousands of years. It is empowering in that it documents the whole human past and is not restricted to dominant political players, such as literate states and empires, with their rich **iconography**, military strength, and historical records. It tells us how the Bantu spread into southern Africa while the Roman empire rose and fell, 2,500 km (1,500 miles) to the north, entirely oblivious to the major population movements further south. It also documents the lives of ordinary people—how they farmed or herded, what they ate and made, how they buried their dead—subjects on which conventional historical sources have relatively little to say. It is also increasingly enabling us to rectify the serious imbalance that has generally emphasized male histories and roles and disregarded those of females; the recent growth of **gender archaeology** is throwing remarkable new light on the lives of women in prehistoric and early historic societies.

A Brief History of Archaeology

Renaissance Beginnings

The origins of archaeology lie some 500 years ago in Europe, during the Renaissance [**1.4**] (Trigger 2006). Medieval scholarship had been constrained by the authority accorded to certain key texts that had been handed down from the ancient world. Chief among these were the Bible and the writings of Classical authors, especially the fourth-century BCE Greek philosopher Aristotle.

In the fifteenth and sixteenth century a series of key developments came together to create the underpinnings of modern Western science. One of those was the invention of the printing press by Johannes Gutenberg in the mid-fifteenth century. Books became cheaper and more readily available, and accompanied a gradual spread of literacy. Reliance on ancient texts also was steadily supplanted by new knowledge derived from direct observation and experimentation. At the same time, European economic expansion led to overseas voyages, which brought knowledge of distant and diverse societies. The Portuguese explored the coast of Africa, and Vasco da Gama rounded the Cape of Good Hope to discover the monsoon route to India in 1498. Six years earlier, Christopher Columbus had successfully crossed the central Atlantic and reached the Caribbean islands. Columbus's achievement was soon followed by European landfalls on the Central American mainland, which set in train the tragic effects of conquest and disease that devastated the indigenous societies of native America.

The voyages of discovery brought back to Europe new information and a new curiosity about human societies and technology that fed directly into the understanding of the European past. Comparisons were drawn between the peoples met with in the newly encountered lands, and the prehistoric occupants of Europe; John White, for example, produced images of so-called "ancient Britons" with body painting based directly on his watercolors of the Native North Americans [**1.5**, **1.6**] he had seen in Virginia in 1585 (Moser 1998).

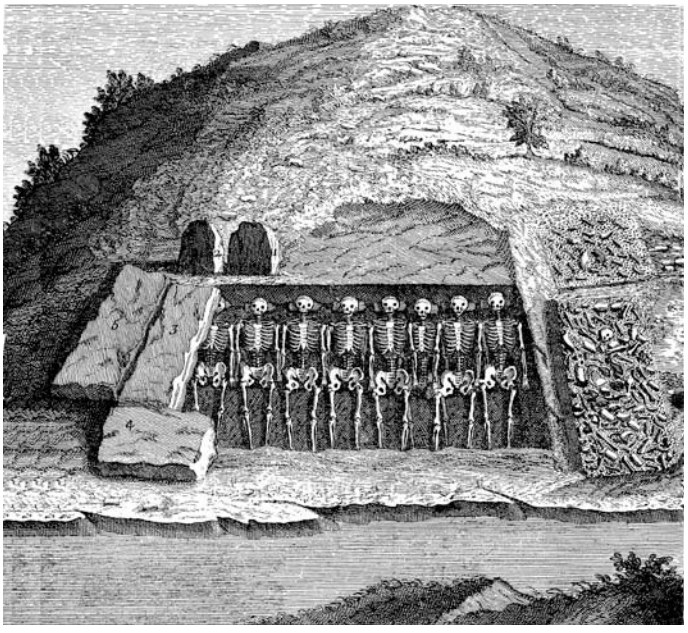
1.4 (Above) **Renaissance rediscovery of Classical antiquity.** Maerten van Heemskerk (1498–1574) was a north European artist who in the 1530s spent several years in Italy, where he was inspired by the ruins of Roman buildings. These appear as the background of many of his paintings and engravings, as in this self-portrait in front of the Colosseum in Rome.

1.5, **1.6** **Early ethnography.** Artist John White accompanied Sir Walter Raleigh on his voyage to establish the colony at Roanoke in Virginia in 1585. He recorded indigenous people along with local fauna and flora in a series of watercolors. After returning to England thirteen months later, these watercolors—for example the North American chief (left)—inspired his imaginary depictions of the pre-Roman inhabitants of Britain, such as the Pictish warrior (far left).

Advances in the Seventeenth and Eighteenth Centuries: The First Excavations

It was Europeans who undertook these world voyages, and so Europeans who were first faced with the full perspective of global human diversity. Archaeology, however, was initially focused on their own lands of northern and western Europe, and only later became a means of exploring the pasts of other peoples [**1.7**]. The first serious investigations of British prehistoric monuments began in the seventeenth century, with John Aubrey's descriptions and plans of Stonehenge and Avebury in southern England. Systematic excavation began only in the late eighteenth century. A pioneering example was the excavation of Native American burial mounds undertaken by Thomas Jefferson in 1784 (Willey and Sabloff 1993).

These early archaeological enquiries were innovative for their time, but were unable to overcome the most fundamental problem of prehistory: that of **chronology**. In much of western Europe, scholars could chart a historical sequence back to the Roman conquests of the first century BCE or CE. Roman authors including Caesar told of the native peoples who were conquered, and sometimes of those who lay just beyond the edges of the empire. Archaeologists in the seventeenth and eighteenth centuries were increasingly able to recognize that many of the remains they were studying were pre-Roman in date, but had no way of establishing their true age. The problem was compounded by biblical scholars, who set the age of the earth at around only 6,000 years old.



1.7 The growth of antiquarian interest. Accurate surveys of European prehistoric monuments were first undertaken in the seventeenth century, as it came to be appreciated that careful observation and recording could yield much additional information about the character and purpose of these structures. Toward the end of the century excavations began to be undertaken, as here in 1685 at the tomb of Cocherel in northern France.

Developments in the Nineteenth Century: Understanding Chronology and Evolution

It was during the nineteenth century that the problem of chronology began to be resolved and the study of prehistoric archaeology was finally born (Daniel 1975; Trigger 2006; Diaz Andreu 2007). Early in the century, archaeological materials began to be sorted into sequences by means of their technology: stone tools had preceded metal ones, and among the latter, bronze had preceded iron. The **Three Age System** of Stone, Bronze, and Iron was established. It was widely used within Europe by the middle years of the nineteenth century, though it is important to observe that it was not applied to other continents—Africa, Australia, or the Americas—where different chronological terms were developed.

Closer study of the **artifacts** led to increasing subdivision of the European "three ages" on the basis both of technology and style. The Stone Age was subdivided into an Old Stone Age or Paleolithic (with tools exclusively of chipped or flaked stone) and a New Stone Age or Neolithic (with tools of polished stone). The Bronze Age and Iron Age, too, were each subdivided into Early, Middle, and Late. These typological methods made it possible to sort objects into sequences that could be checked by excavation and thus provide a **relative chronology**. For example, did the different types follow each other in correct order in successive layers? These approaches did not, however, reveal exact ages, nor the length of the different phases or stages.

A crucial change in understanding of the human past came in the middle decades of the nineteenth century, with three interlinked developments (Daniel 1975; Grayson 1983). First, was the demonstration in the 1830s that early human chipped stone tools could be found in the gravels of European rivers associated with remains of such extinct species as mammoth and woolly rhinoceros. This indicated the great age of the human tools. Second, was the chance discovery of a premodern skeleton in a limestone cave in the Neander Valley in western Germany in 1856. This was the first fossil hominin—a Neanderthal [**1.8**, see p. 30]—to be generally recognized as such, and gave evidence of the development of modern humans from earlier, archaic human forms.

The third key event was the publication of Charles Darwin's *On the Origin of Species* in 1859, followed by his *Descent of Man* in 1871 (Bowler 1990). In 1831, the young Charles Darwin (1809–1882) had embarked on a voyage of survey and exploration in the *Beagle*, which was mapping the coast of South America. His observations of the diversity and interrelationships of the species of plants and animals he encountered and recorded led him, in the following decades, to recognize the key role of natural selection in shaping the development of individual species over time (Chapter 2). Successful individuals within a species would

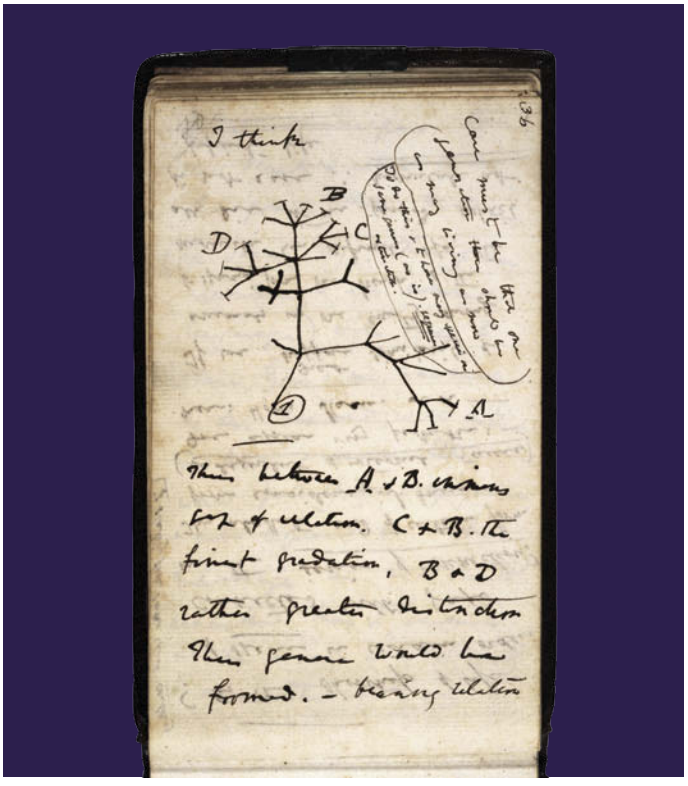
1.8 The first fossil evidence for human ancestry. The skull cap and associated bones discovered in 1856 at the Feldhoffer Cave in the Neander Valley of western Germany were the first direct fossil evidence for human ancestry to be recognized as such, though it was dismissed by skeptics for many years. Further discoveries in the 1880s and early 1900s finally laid these objections to rest.

be more likely to reproduce and pass on their characteristics to their offspring, and thus features that conferred an advantage—a longer beak, a different coloring—would spread through a population. Ultimately, a single species might be divided into sub-groups, each of which was increasingly specialized and successful within its particular environmental niche. This could lead eventually to the division of one species into two or more separate species, each of which would become increasingly different from the others as they respectively underwent further adaptations to their environment. Darwin's theory was revolutionary in suggesting that the diversity of life was not the result of divine creation, but of natural processes that could still be observed in the present day. Furthermore, what was true for animals could also be applied to humans.

Darwin's views brought him into fierce conflict with others, who continued to maintain that the account of divine creation contained within the Bible was correct. Gradually, however, his theory succeeded in winning general acceptance as the most persuasive explanation for the development of the diversity of life [**1.9**]. It came to be appreciated that humans, along with other species, are not fixed in their form or behavior, but are constantly changing in response to the pressures and circumstances around them. The model of evolution through natural selection was given further support by advances in genetics, beginning with Austrian botanist Gregor Mendel's plant-breeding experiments in the 1860s, which showed how particular characteristics are passed from parent to offspring. With the rapidly developing knowledge of **DNA** in the past fifty years, geneticists are now able to explain in detail how Darwinian natural selection operates at the level of the genetic code.

For some, however, these new understandings are unwelcome, and a number of people continue to believe in a creationist view: that the world, and all the species within it, were created in the form we see them today by divine action. Archaeology allows us to demonstrate that creationist views, though deeply held, are incompatible with the evidence of the past that is available to us. The fossil record of human evolution, with its numerous and increasingly well-dated remains of earlier hominin species, indicates clearly the steady **morphological** and behavioral change that preceded the development of the first modern humans between 350,000 and 200,000 years ago. Nor did natural selection stop at that point: to this day we are still continuously (if almost imperceptibly) changing in response to selective pressures.

Darwin's thesis of human origins, coupled with the discovery of the Neanderthal fossils and the early stone tools, suggested that the human story went back much further than had previously been supposed, and could certainly not be accommodated within the 6,000 years offered by the biblical time frame. This new knowledge allowed for the study of human prehistory to begin in earnest.



1.9 The theory of evolution. Charles Darwin's theory of the origin of species through natural selection presented a powerful challenge to the Christian religious belief in a divine creation, but provided the context in which human evolution and the development of early societies could be understood. Darwin's earliest drawing of the Tree of Life dates to 1837, but his book *On the Origin of Species* was not published until 1859.