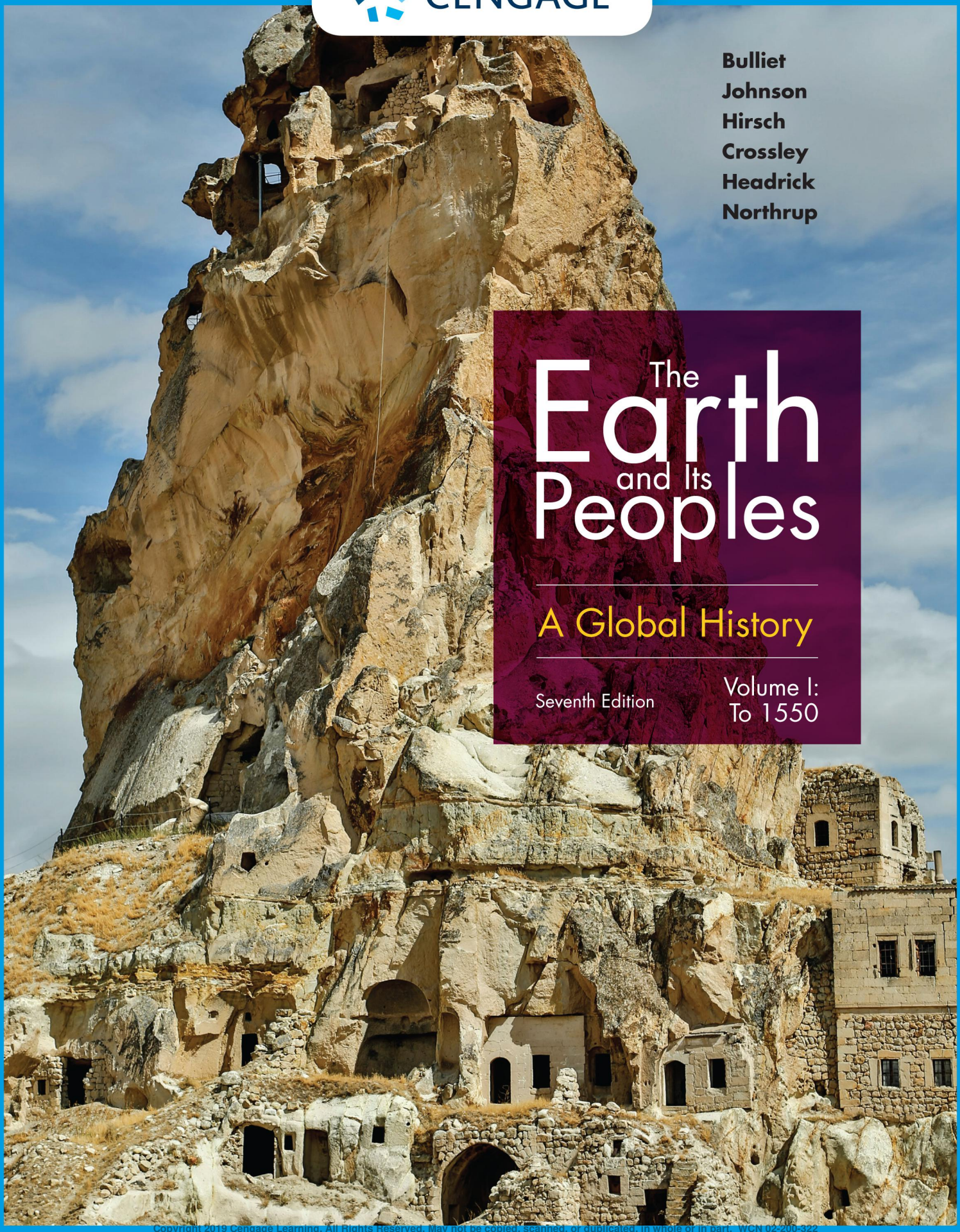

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The Earth and Its Peoples

A Global History

Seventh Edition

Volume I: To 1550

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A Global History Seventh Edition

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ABBREVIATIONS

AUS.	AUSTRIA
BEL.	BELGIUM
B. H.	BOSNIA AND HERZEGOVINA
CR.	CROATIA
CZ.	CZECH REPUBLIC
DEN.	DENMARK
HUNG.	HUNGARY
K.	KOSOVO
LUX.	LUXEMBOURG
MAC.	MACEDONIA
MO.	MONTENEGRO
NETH.	NETHERLANDS
SE.	SERBIA
SLK.	SLOVAKIA
SLN.	SLOVENIA
SWITZ.	SWITZERLAND

CENGAGE

***The Earth and Its Peoples: A Global History, Volume I: To 1550*, Seventh Edition**

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Preface

The overall goal of *The Earth and Its Peoples* remains as it has been since its first edition: to be a textbook that speaks not only for the past but also to today's student and teacher. Students and instructors alike should take away from this text a broad and flowing impression of human societies beginning as sparse and disconnected communities reacting creatively to local circumstances; experiencing ever more intensive stages of contact, interpenetration, and cultural expansion and amalgamation; and arriving at a twenty-first-century world in which people increasingly visualize, and sometimes challenge, a single global community.

Process, not progress, is the keynote of this book: a steady process of change over time, at first experienced differently in various regions but eventually connecting peoples and traditions from all parts of the globe. Students should come away from this book with a sense that the problems and promises of their world are rooted in a past in which people of every sort, in every part of the world, confronted problems of a similar character and coped with them as best they could. We believe that our efforts will help students see where their world has come from and thereby learn something useful for their own lives.

Central Themes and Goals

We subtitled *The Earth and Its Peoples* "A Global History" because the book explores the common challenges and experiences that unite the human past. Although the dispersal of early humans to every livable environment resulted in a myriad of different economic, social, political, and cultural systems, all societies displayed analogous patterns in meeting their needs and exploiting their environments. Our challenge was to select the particular data and episodes that would best illuminate these global patterns of human experience.

To meet this challenge, we adopted two themes for our history: "technology and the environment" and "diversity and dominance." The first theme represents the commonplace material bases of all human societies at all times. It grants no special favor to any cultural group even as it embraces subjects of the broadest topical, chronological, and geographical range. The second theme expresses the reality that every human society has constructed or inherited structures of domination. We examine practices and institutions of many sorts: military, economic, social, political, religious, and cultural, as well as those based on kinship, gender, and literacy. Simultaneously we recognize that alternative ways of life and visions of societal organization continually manifest themselves both within and in dialogue with every structure of domination.

With respect to the first theme, it is vital for students to understand that technology, in the broad sense of experience-based knowledge of the physical world, underlies all human activity. Writing is a technology, but so is oral transmission from generation to generation of lore about medicinal or poisonous plants. The magnetic compass is a navigational technology, but so is Polynesian mariners' hard-won knowledge of winds, currents, and tides that made possible the settlement of the Pacific islands.

All technological development has come about in interaction with environments, both physical and human, and has, in turn, affected those environments. The story of how humanity has changed the face of the globe is an integral part of our first theme. Yet technology and the environment do not explain or underlie all important episodes of human experience. The theme of "diversity and dominance" informs all our discussions of politics, culture, and society. Thus when narrating the histories of empires, we describe a range of human experiences within and beyond the imperial frontiers without assuming that imperial institutions are a more fit topic for discussion than the economic and social organization of pastoral nomads or the lives of peasant women. When religion and culture occupy our narrative, we focus not only on the dominant tradition but also on the diversity of alternative beliefs and practices.

Organization

The *Earth and Its Peoples* uses eight broad chronological divisions to define its conceptual scheme of global historical development.

In **Part I: The Emergence of Human Communities, to 500 BCE**, we examine important patterns of human communal organization primarily in the Eastern Hemisphere. Small, dispersed human communities living by foraging spread to most parts of the world over tens of thousands of years. They responded to enormously diverse environmental conditions, at different times in different ways, discovering how to cultivate plants and utilize the products of domestic animals. On the basis of these new modes of sustenance, population grew, permanent towns appeared, and political and religious authority, based on collection and control of agricultural surpluses, spread over extensive areas.

Part II: The Formation of New Cultural Communities, 1000 BCE–400 CE introduces the concept of a "cultural community," in the sense of a coherent pattern of activities and symbols pertaining to a specific human community. While all human communities develop distinctive cultures, including those discussed in Part I, historical development in this stage of global history prolonged and magnified the impact of some cultures more than others. In the geographically contiguous African-Eurasian landmass, as well as in the Western Hemisphere, the cultures that proved to have the most enduring influence traced their roots to the second and first millennia BCE.

Part III: Growth and Interaction of Cultural Communities, 300 BCE–1200 CE deals with early episodes of technological, social, and cultural exchange and interaction on a continental scale both within and beyond the framework of imperial expansion. These are so different from earlier interactions arising from more limited conquests or extensions of political boundaries that they constitute a distinct era in world history, an era that set the world on the path of increasing global interaction and interdependence that it has been following ever since.

In **Part IV: Interregional Patterns of Culture and Contact, 1200–1550**, we look at the world during the three and a half centuries that saw both intensified cultural and commercial contact and increasingly confident self-definition of cultural communities in Europe, Asia, Africa, and the Americas. The Mongol conquest of a vast empire extending from the Pacific Ocean to eastern Europe greatly stimulated trade and interaction. In the West, strengthened European kingdoms began maritime expansion in the Atlantic, forging direct ties with sub-Saharan Africa and entering into conflict with the civilizations of the Western Hemisphere.

Part V: The Globe Encompassed, 1500–1750 treats a period dominated by the global effects of European expansion and continued economic growth. European ships took over, expanded, and extended the maritime trade of the Indian Ocean, coastal Africa, and the Asian rim of the Pacific Ocean. This maritime commercial enterprise had its counterpart in European colonial empires in the Americas and a new Atlantic trading system. The contrasting capacities and fortunes of traditional land empires and new maritime empires, along with the exchange of domestic plants and animals between the hemispheres, underline the technological and environmental dimensions of this first era of complete global interaction.

In **Part VI: Revolutions Reshape the World, 1750–1870**, the word *revolution* is used in several senses: in the political sense of governmental overthrow, as in France and the Americas; in the metaphorical sense of radical transformative change, as in the Industrial Revolution; and in the broadest sense of a perception of a profound change in circumstances and worldview. Technology and environment lie at the core of these developments. With the rapid ascendancy of the Western belief that science and technology could overcome all challenges—environmental or otherwise—technology became an instrument not only of transformation but also of domination, to the point of threatening the integrity and autonomy of cultural traditions in nonindustrial lands and provoking strong movements of resistance.

Part VII: Global Diversity and Dominance, 1750–1945 examines the development of a world arena in which people conceived of events on a global scale. Imperialism, international economic connections, and world-encompassing ideological tendencies, such as nationalism and socialism, present the picture of a globe becoming increasingly involved with European political and ideological concerns. Two world wars arising from European rivalries provide a climax to these developments, and European exhaustion affords other parts of the world new opportunities for independence and self-expression.

For **Part VIII: Perils and Promises of a Global Community, 1945 to the Present**, we divide the period since World War II into three time periods: 1945–1975, 1975–2000, and 2000 to the present. The challenges of the Cold War and postcolonial nation building dominate much of the period and unleash global economic, technological, and political forces that become increasingly important in all aspects of human life. With the end of the Cold War, however, new forces come to the fore. Technology is a key topic in Part VIII because of its integral role in both the growth and the problems of a global community. However, its many benefits in improving the quality of life become clouded by negative impacts on the environment. Other negative impacts come from the spread of instability, terrorist disruption, and military intervention in many troubled parts of the globe along with a growth of animosity toward groups that are suspected of supporting such disruptions.

Features and New Pedagogical Aids

As with previous editions, the seventh edition offers, in addition to enhanced visual design, a number of valuable features and pedagogical aids designed to pique student interest in specific world history topics and help them process and retain key information. Challenging questions designed to prompt inquiry into historical processes have been added to each map, to every feature box, and to the end of every chapter. And each of the eight parts now climaxes in two essays called Issues in World History and Material Culture. These are specifically designed to alert students to broad and recurring conceptual issues that are of great interest to contemporary historians. The Issues in World History essay for Part VIII, "Popular Culture: Words of Warning," is entirely new; "Religious Conversion" has been restored from an earlier edition; and "Little Ice Age" has been substantially updated. A Material Culture essay on "Roads" is also new. The Environment & Technology feature, which has been a valuable resource in all prior editions of *The Earth and Its Peoples*, serves to illuminate the major theme of the text by demonstrating the shared material bases of all human societies across time. Eight of the features are new with this edition: "Nomad Homes," "Roads," "Stained Glass Windows," "The West African Voyage of Hanno the Carthaginian," "East Asian Transportation," "Persian Rugs," "New Wars, New Tools," and "Intelligence and Technology." Finally, there are six new or heavily revised Diversity & Dominance features containing primary source readings that bring a myriad of real historical voices to life in the age-old tug-of-war between power and autonomy: "Poetry and Society in Early China and Greece," "Becoming Muslim," "Justice and Kingship," "Understanding Cross-Cultural Encounters," "The Manchu Moment from Ming to Ching," and "Madame de Staël Remembers Napoleon."

Pedagogical aids include:

- **Focus Questions** These questions are keyed to every major subdivision of the chapter and serve to help students focus on the core chapter concepts.
- **Subsection Listings** These have been added to the chapter outline to make the structure of the chapter clear from the outset.
- **Section Reviews** Short bullet-point reviews summarize each major section in every chapter and remind students of key information.
- **Chapter Conclusions** Every chapter ends with a comparative conclusion that helps students better synthesize chapter material and understand how it fits into the larger picture.
- **Marginal Key Term with Definitions** Students can handily find key term definitions on the same page where the term first appears.
- **Pronunciation Guide** Hard-to-pronounce words are spelled phonetically for students throughout the text.
- **Suggested Readings** These have been expanded and resituated from the end of each chapter to a separate online instructor's resource.

Changes in This Edition

In addition to the pedagogical aids outlined above, numerous chapter-by-chapter changes have been made, including new illustrations, new maps, streamlining of the textual discussion, and updates to many of the boxed feature essays. Here are a few highlights:

- Chapter 1 includes new discussion of the recent discovery of *Homo naledi* (now a key term) in South Africa, with a new photo of the skeleton of the hand and foot.

- Chapter 3 contains a new Environment & Technology feature, "The West African Voyage of Hanno the Carthaginian," and includes new Map 3.6 depicting the path of Hanno's expedition. Crucial information from the previous edition's feature, "Ancient Textiles and Dyes," has been incorporated into the section on Phoenician city-states.
- Chapter 4 has a new Diversity & Dominance feature, "Poetry and Society in Early China and Greece," that compares outlooks on Chinese society through poems from the Chinese *Book of Songs*, with Greek poems by Sappho and Tyrtaeus.
- Chapter 7 includes new art, including a new chapter-opening photo of the exterior of the Temple of Minakshi at Madurai, a sculpture depicting Buddha at the moment he achieves enlightenment, and a new wall painting from the caves at Ajanta that reflects members of different castes and ethnic groups.
- Chapter 10 includes a new subsection, "Marginal Communities," as well as a Diversity & Dominance feature, "Becoming Muslim," that gives firsthand accounts of conversions to the faith.
- Chapter 12 has changed the title and all internal references from "Inner Asia" to "Central Asia." The introduction has also been heavily updated.
- Chapter 14 contains new discussion of the coach's introduction to western Europe from Hungary in the late 1400s. It also includes a new Environment & Technology feature, "Stained Glass Windows."
- Chapter 15 includes revisions to the introduction to the section "Tropical Africa and Asia" and the subsection "The Tropical Environment in Africa and Asia." The Diversity & Dominance feature contains a new excerpt from *The Tale of the Anklet*.
- In addition to several new illustrations, Chapter 17 contains added discussion of the Catholic Church's council meetings between 1545 and 1563 and of Phillip II.
- Chapter 18 contains new discussion of the application of the label "Indian" and the position of native elites, as well as new coverage of the hundreds of distinct native peoples in the English and French colonies in North America.
- Chapter 19 contains updates to the modern conversions of a planter's expenses and a rural laborer and wealthy noble family's incomes and provides the most recent research and statistics on the importation of African slaves into Islamic regions.
- Chapter 22 includes several new illustrations, as well as updated and expanded subsections on "Changes in Society," "Protests and Reforms," "India," and the "Conclusion."
- Chapter 23 contains new coverage of the baroness Germaine de Staël, including a portrait and a new Diversity & Dominance feature that uses an excerpt from de Staël's memoir to shed light on Napoleon's character.
- Chapter 24 includes an updated Environment & Technology feature, "The Web of War," with the addition of a firsthand account of the siege of Sevastopol (the Crimean capital) from the *Times* of London.
- Chapter 27 includes revisions to several sections, including "The New Power Balance, 1850–1900," "Nationalism and the Rise of Italy, Germany, and Japan," and "China, Japan, and the Western Powers."
- Chapter 28 includes a new Environment & Technology feature, "New War, New Tools," that describes the technological advances of World War I including chemical warfare, flamethrowers, concertina wire, radios, food rations, and camouflage.
- In this edition, the chapter "The Collapse of the Old Order, 1929–1949" (now Chapter 29) appears before the chapter "Revolutions in Living, 1900–1950" (now Chapter 30).
- Chapter 31 contains an updated introduction to Part VIII that adds insight about industrial and economic recovery after the end of World War II, as well as additions about global famine.
- Chapter 32 contains new and updated statistics throughout that reflect the most recent research, including data through 2000 in Table 32.1. The chapter also notes the recent violence and civil wars in Syria and Libya.
- Chapter 33 covers updates in world affairs through the first half of 2017, including the 2016 terror attacks in Paris and Brussels; the elevation of Pope Francis I; Brexit; the abortive military coup in Turkey in 2016; and the election of Donald Trump and the early acts of the new administration. The section "The Question of Values" has been moved and is now the first section in the chapter.

Formats

To accommodate different academic calendars and approaches to the course, *The Earth and Its Peoples* is available in two formats. There is a one-volume hardcover version containing all 33 chapters, along with a two-volume paperback edition: Volume I: To 1550 (Chapters 1–16) and Volume II: Since 1500 (Chapters 16–33).

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***The Modern Researcher*, 6e ISBN 9780495318705** Prepared by Jacques Barzun and Henry F. Graff of Columbia University. This classic introduction to the techniques of research and the art of expression thoroughly covers every aspect of research, from the selection of a topic through the gathering of materials, analysis, writing, revision, and publication of findings. They present the process not as a set of rules but through actual cases that put the subtleties of research in a useful context. Part I covers the principles and methods of research; Part II covers writing, speaking, and getting one's work published.

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When textbook authors set out on a project, they are inclined to believe that 90 percent of the effort will be theirs and 10 percent that of various editors and production specialists employed by their publisher. How very naive. This book would never have seen the light of day had it not been for the unstinting labors of the great team of professionals who turned the authors' words into beautifully presented print and supplied a marvelous set of visual accompaniments. Our debt to the staff of Cengage Learning remains undiminished in the seventh edition. Scott Greenan helped shape this edition as Product Manager for Western Civilization and World History. Sarah Edmonds, our Content Developer, has been an extraordinarily helpful and multitasking manager for the project. Phil Scott has overseen the technical side of things as Project Manager from SPi Global. Carol Newman, our coworker for several editions, has again kept us on schedule. And Charlotte Miller continues to do her wonderful work on maps.

We also thank the many students whose questions and concerns, expressed directly or through their instructors, shaped much of this revision. We continue to welcome all readers' suggestions, queries, and criticisms. Please contact us at our respective institutions.

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Note on Spelling and Usage

Where necessary for clarity, dates are followed by the letters CE or BCE. The abbreviation CE stands for "Common Era" and is equivalent to AD (anno Domini, Latin for "in the year of the Lord"). The abbreviation BCE stands for "before the Common Era" and means the same as BC ("before Christ"). In keeping with our goal of approaching world history without special concentration on one culture or another, we chose these neutral abbreviations as appropriate to our enterprise. Because many readers will be more familiar with English than with metric measurements, however, units of measure are generally given in the English system, with metric equivalents following in parentheses.

In general, Chinese has been Romanized according to the pinyin method. Exceptions include proper names well established in English (e.g., Canton, Chiang Kaishek) and a few English words borrowed from Chinese (e.g., kowtow). Spellings of Arabic, Ottoman Turkish, Persian, Mongolian, Manchu, Japanese, and Korean names and terms avoid special diacritical marks for letters that are pronounced only slightly differently in English. An apostrophe is used to indicate when two Chinese syllables are pronounced separately (e.g., Chang'an).

For words transliterated from languages that use the Arabic script—Arabic, Ottoman Turkish, Persian, Urdu—the apostrophe indicating separately pronounced syllables may represent either of two special consonants, the hamza or the ain. Because most English-speakers do not hear the distinction between these two, they have not been distinguished in transliteration and are not indicated when they occur at the beginning or end of a word. As with Chinese, some words and commonly used place-names from these languages are given familiar English spellings (e.g., Quran instead of Qur'an, Cairo instead of al-Qahira). Arabic romanization has normally been used for terms relating to Islam, even where the context justifies slightly different Turkish or Persian forms, again for ease of comprehension.

Before 1492 the inhabitants of the Western Hemisphere had no single name for themselves. They had neither a racial consciousness nor a racial identity. Identity was derived from kin groups, language, cultural practices, and political structures. There was no sense that physical similarities created a shared identity. America's original inhabitants had racial consciousness and racial identity imposed on them by conquest and the occupation of their lands by Europeans after 1492. All of the collective terms for these first American peoples are tainted by this history. *Indians*, *Native Americans*, *Amerindians*, *First Peoples*, and *Indigenous Peoples* are among the terms in common usage. In this book the names of individual cultures and states are used wherever possible. Amerindian and other terms that suggest transcultural identity and experience are used most commonly for the period after 1492.

There is an ongoing debate about how best to render Amerindian words in English. It has been common for authors writing in English to follow Mexican usage for Nahuatl and Yucatec Maya words and place-names. In this style, for example, the capital of the Aztec state is spelled Tenochtitlán, and the important late Maya city-state is spelled Chichén Itzá. Although these forms are still common even in the specialist literature, we have chosen to follow the scholarship that sees these accents as unnecessary. The exceptions are modern place-names, such as Mérida and Yucatán, which are accented. A similar problem exists for the spelling of Quechua and Aymara words from the Andean region of South America. Although there is significant disagreement among scholars, we follow the emerging consensus and use the spellings *khipu* (not *quipu*), *Tiwanaku* (not *Tiahuanaco*), and *Wari* (not *Huari*). In this edition we have introduced the now common spelling *Inka* (not *Inca*) but keep *Cuzco* for the capital city (not *Cusco*), since this spelling facilitates locating this still-important city on maps.

The Earth and Its Peoples

PART I

The Emergence of Human Communities, to 500 BCE

Human beings evolved over several million years from primates in Africa. Able to walk upright and possessing large brains, hands with opposable thumbs, and the capacity for speech, early humans used teamwork and created tools to survive in diverse environments. They spread relatively quickly to almost every habitable area of the world, hunting and gathering wild plant products. Around 10,000 years ago some groups began to cultivate plants, domesticate animals, and make pottery vessels for storage. These developments led to permanent settlements—at first small villages but eventually larger towns.

The earliest complex societies arose in the great river valleys of Mesopotamia, Egypt, Pakistan, and northern China. In these arid regions agriculture depended on river water, and centers of political power arose to organize the labor required to dig and maintain irrigation channels. Kings and priests dominated these early societies from the urban centers, helped by administrators, scribes, soldiers, merchants, craftsmen, and others with specialized skills. Surplus food grown in the countryside by a dependent peasantry sustained the activities of these groups.

As they sought access to raw materials, especially metals, certain centers came to dominate broader expanses of territory. This development also stimulated long-distance trade and diplomatic relations between major powers. Artisans made weapons, tools, and ritual objects from bronze, and culture and technology spread to neighboring regions, such as southern China, Nubia, Syria-Palestine, Anatolia, and the Aegean.

In the Western Hemisphere, different geographical circumstances led to distinctive patterns of technological and cultural response. These early civilizations in southern Mexico and the Andean region of South America are discussed in Part II. ●

▲ **Babylonian Map of the World, ca. 600 BCE** This map on a clay tablet, with labels written in Akkadian cuneiform, shows a flat, round world with the city of Babylon at the center. Nearby features of the Mesopotamian landscape include the Euphrates River, mountains, marshes, and cities. Beyond the great encircling salt sea are seven islands. Like many ancient peoples, the Babylonians believed that distant lands were home to legendary beasts, strangely formed peoples, and mysterious natural phenomena. The Trustees of the British Museum/Art Resource, NY

1 Nature, Humanity, and History, to 3500 BCE

CHAPTER OUTLINE

Paintings and engravings on stone created tens of thousands of years ago by early humans have been found on every continent. Someone in Central Africa carved this image of cattle around 5000 BCE, when the Sahara was not a desert but a verdant savanna supporting numerous species of wildlife. Why the image was carved and what significance it originally held will likely remain a mystery, but for us it is a beautiful work of art that reveals much about our human ancestry.

Long before the invention of writing, societies told themselves stories about how human beings and the natural world were created. Some, like the Yoruba **(yoh-roo-bah)** people of West Africa, related that the first humans came down from the sky; others, like the Hopi of southwest North America, claimed that they emerged out of a hole in the earth. Although such creation myths typically explain how a people's way of life, social divisions, and cultural system arose, historical accuracy in the modern sense was not their primary purpose. As with the story of Adam and Eve in the Hebrew Bible, their goal was to define the moral principles that people thought should govern their dealings with the supernatural world, with each other, and with the rest of nature.

In the nineteenth century evidence began to accumulate about the actual origins of humanity. Natural scientists were finding remains of early humans who resembled apes. Other discoveries suggested that the familiar ways of life based on farming and herding did not arise within a generation or two of creation, as many myths suggested, but tens of thousands of years after humans first appeared. This evidence provides insights into human identity that are as meaningful as those propounded by the creation myths.

▲ **Engraving of Two Cattle in the Sahara, ca. 5000 BCE** Around 10,000 people settled in the central Sahara and began to engrave rocks with pictures of animals. The engravings display an expert knowledge of animal stance, movement, and anatomy. David Coulson/Robert Estall Photo Agency

1-1 African Genesis

In light of scientific advances in our understanding of human origins, what have we learned about our relationship to the earth and other living species?

The discovery in the mid-nineteenth century of the remains of ancient creatures that had both humanlike and apelike features generated excitement and controversy. The finds upset many people because they challenged religious beliefs about human origins. Others welcomed the new evidence for what some had long suspected: that the physical characteristics of modern humans had evolved over incredibly long periods of time.

1-1a Interpreting the Evidence

In 1856 in the Neander Valley of Germany, laborers discovered fossilized bones of a creature with a body much like that of modern humans but with a face that had heavy brow ridges and a low forehead, like the faces of apes. Although we now know these were Neanderthals, a type of human common in Europe and the Middle East from 135,000 to 25,000 years ago, in the mid-nineteenth century the idea of humans that different from modern people was so novel that some scholars thought they must be deformed individuals from recent times.

Three years after the Neanderthal finds, Charles Darwin, a young English *naturalist* (student of natural history), published *On the Origin of Species*, in which he argued that the time frame for all biological life was far longer than most people supposed. Darwin based his conclusion on the pioneering research of others and on his own investigations of fossils and living plant and animal species in Latin America. He proposed that the great diversity of living species and the profound changes in them over time could be explained by natural selection,

the process by which biological variations that enhance a population's ability to survive become dominant in that species. He theorized that, over long periods of time, the changes brought about by this process could lead to the **evolution** of distinct new species.

Turning to the sensitive subject of human evolution in *The Descent of Man* (1871), Darwin summarized the growing consensus among naturalists that human beings had come into existence through the same process of natural selection. Because humans shared so many physical similarities with African apes, he proposed Africa as the home of the first humans, even though there was no fossil evidence at the time to support his hypothesis.

The next major discoveries pointed to Asia, rather than Africa, as the original human home. On the Indonesian island of Java in 1891, Eugene Dubois uncovered an ancient skullcap of what was soon called Java man. In 1929 near Peking (an old form of Beijing **[bay-jeeng]**), China, W. C. Pei discovered a similar skullcap of what became known as Peking man.

By then, even older fossils had been found in southern Africa. In 1924 Raymond Dart found the skull of a creature that he named *Australopithecus africanus* **(aw-strah-loh-PITH-uh-kuhs ah-frih-KAH-nuhs)** (African southern ape), which he argued was transitional between apes and early humans. For many years most specialists disputed Dart's idea because, although *Australopithecus africanus* walked upright like a human, its brain was the size of an ape's.

Since 1950, Louis and Mary Leakey and their son Richard, along with many others, have discovered a wealth of early human fossils in the exposed sediments of the Great Rift Valley of eastern Africa. These finds are strong evidence for Dart's hypothesis and for Darwin's guess that the tropical habitat of the African apes was the cradle of humanity.

The development of modern archaeological techniques has added to our knowledge. Rather than collect isolated bones, researchers sift the neighboring soils to extract the fossilized remains of other creatures, seeds, and even pollen existing at the time, documenting the environment in which early humans lived. They can also measure the age of most finds by the rate of molecular change in potassium, contained in minerals in lava flows, or in carbon from wood and bone.

A major new approach was made possible by the full decipherment of the human genetic code in 2003. Researchers have been able to extrapolate backward from genetic differences among contemporary human populations to answer such questions as when language first emerged; the approximate size and location in northeast Africa of the ancestral human population and the date when some of its members moved out of the continent; the paths taken by migrating groups as humans ultimately spread to all habitable parts of the planet; and when the skin color of the various human populations developed.

By combining these forms of evidence with the growing understanding of how other species adapt to their natural environments, researchers can trace the evolutionary changes that produced modern humans over the course of millions of years.

1-1b Human Evolution

evolution The biological theory that, over time, changes occurring in plants and animals, mainly as a result of natural selection and genetic mutation, result in new species.

australopithecines The several extinct species of humanlike primates that existed from about 4.5 million years ago to 1.4 million years ago (genus Australopithecus).

hominids The biological family that includes humans and humanlike primates.

bipedalism The ability to walk upright on two legs, characteristic of hominids.

Biologists classify **australopithecines (aw-strah-loh-PITH-uh-seen)** and humans as members of a family of primates known as **hominids (HOM-uh-nid)**. Primates are members of a class of warm-blooded, four-limbed, social animals known as mammals that came to prominence about 65 million years ago. The first hominids are now dated to about 7 million years ago.

Among living primates, modern humans are most closely related to the African apes—chimpanzees and gorillas. Since Darwin's time it has been popular (and controversial) to say that we are descended from apes. In fact, apes and humans share a common ancestor. Over 99 percent of human deoxyribonucleic acid (DNA), the basic genetic blueprint, is identical to that of the great apes. But three traits distinguish humans from apes and other primates. The earliest of these traits to appear was **bipedalism** (walking upright on two legs). Being upright frees the forelimbs from any role in locomotion and enhances an older primate trait: a hand with a long, opposable thumb that can work with the fingers to manipulate objects skillfully. Modern humans' second distinctive trait is a very large brain. Besides enabling humans to think abstractly, experience profound emotions, and construct complex social relationships, this larger brain controls the fine motor movements of the hand and of the tongue, increasing humans' tool-using capacity and facilitating the development of speech. The physical possibility of language, however, depends on a third distinctive human trait: the location of the *larynx* (voice box). In humans it lies much lower in the neck than in any other primate.

CHRONOLOGY

	Geological Epochs	Species and Migrations	Technological Advances
7,000,000 BCE		7,000,000 BCE Earliest hominids	
4,000,000 BCE		4,500,000 BCE Australopithecines 2,300,000 BCE Early *Homo habilis*	2,600,000 BCE Earliest stone tools; hunting-and-gathering (foraging) societies
2,000,000 BCE	2,000,000–9000 BCE Pleistocene (Great Ice Age)	1,800,000–350,000 BCE *Homo erectus*	2,000,000–8000 BCE Paleolithic (Old Stone Age)
1,000,000 BCE			500,000 BCE Use of fire
200,000 BCE		200,000–100,000 BCE Anatomically modern *Homo sapiens* in Africa 80,000–50,000 BCE Behaviorally modern *Homo sapiens* possessing language; migrations to Eurasia 46,000 BCE Modern humans in Australia 18,000 BCE Modern humans in Americas	30,000 BCE First cave paintings
10,000 BCE	9000 BCE–present Holocene		8000–2000 BCE Neolithic (New Stone Age); earliest agriculture

These critical biological traits are due to natural selection, the preservation of genetic changes that enhanced the ability of the ancestors of modern humans to survive and reproduce. Major shifts in the world's climate led to evolutionary changes in human ancestors and other species. Falling temperatures culminated in the **Great Ice Age**, or Pleistocene **(PLY-stuh-seen)** epoch, extending from about 2 million to about 9000 BCE (see Chronology). These temperature changes and altered rainfall and vegetation imposed great strains on plant and animal species, causing large numbers of new species to evolve.

Beginning approximately 4.5 million years ago, several species of australopithecines evolved in southern and eastern Africa. In northern Ethiopia in 1974, Donald Johanson unearthed a well-preserved skeleton of a twenty-five-year-old female, whom he nicknamed Lucy. Mary Leakey's discovery of fossilized footprints in Tanzania in 1977 provided spectacular visual evidence that australopithecines walked on two legs.

Bipedalism evolved because it provided australopithecines with some advantage for survival. Some studies suggest that walking and running on two legs is very energy efficient. Another theory is that bipeds survived better because they could carry armfuls of food back to their mates and children.

Climate changes between 2 and 3 million years ago led to the evolution of a new species, the first to be classified in the same genus (*Homo*) with modern humans. At Olduvai **(ol-DOO-vy)** Gorge in northern Tanzania in the early 1960s, Louis Leakey discovered the fossilized remains of a creature that he named ***Homo habilis*** **(HOH-moh HAB-uh-luhs)** (handy human). What most distinguished *Homo habilis* from the australopithecines was a brain that was nearly 50 percent larger. Greater intelligence may have enabled *Homo habilis* to locate things to eat throughout the seasons of the year. Seeds and other fossilized remains found in ancient *Homo habilis* camps indicate that the new species ate a greater variety of more nutritious foods than did australopithecines.

By 1 million years ago *Homo habilis* and all the australopithecines had become extinct. In their habitat lived a new hominid, ***Homo erectus*** **(HOH-moh ee-REK-tuhs)** (upright human), which first appeared in eastern Africa about 1.8 million years ago. (It is uncertain whether *Homo erectus* evolved from *Homo habilis* or both species descended from *Australopithecus*.) These creatures possessed brains a third larger than those of *Homo habilis*, which presumably accounted for their better survivability. A nearly complete skeleton of a twelve-year-old male of the species discovered by Richard Leakey in 1984 on the shores of Lake Turkana in Kenya shows

Great Ice Age Geological era that occurred between about 2 million and 11,000 years ago.

Homo habilis The first human species (now extinct). It evolved in Africa about 2.3 million years ago.

Homo erectus An extinct human species. It evolved in Africa about 1.8 million years ago.

Stefan Fichtel/National Geographic Creative

▲ **Hand and Foot of *Homo naledi*** The foot is designed for walking upright, while the hand combines more modern features with curved fingers for climbing trees.

Smithsonian Institution

▲ **Skull Casts of Early Hominids** These skulls show the extensive cranial changes associated with the increase in brain size during 2.5 million years of evolutionary change. *Australopithecus* on the left, *Homo erectus* in the middle, *Homo sapiens* on the right.

that *Homo erectus* closely resembled modern people from the neck down. *Homo erectus* was very successful in dealing with different environments and underwent hardly any biological changes for over a million years.

A recent discovery in South Africa both complicates our understanding of human evolution and challenges a number of conventional beliefs. Over 1,500 bone fragments from fifteen or more individuals have been excavated from a remote and not easily accessible cave floor. ***Homo naledi***, as the new species has been called, displays a curious mix of more and less primitive features. The skull and small brain are similar to those of australopithecines, but other features are like those of more advanced hominids, including feet designed for walking upright and long, curved hands that would have made it adept at climbing trees. There is still much controversy about the dating of this species, based largely on comparing its skeletal features with those of other hominid types, with suggested dates ranging between 2 million and 900,000 years ago. Experts are also still debating whether the bones were purposely deposited deep in the cave as a kind of burial and whether this would have required the use of torches. Even on the later proposed dating, this would attest to the use of fire and the existence of social rituals long before these behaviors existed according to the conventional view.

Sometime between 200,000 and 100,000 years ago, a new human species emerged: ***Homo sapiens*** **(HOH-moh SAY-pee-enz)** (wise human). The brains of *Homo sapiens* were a third larger than those of *Homo erectus*, whom they gradually superseded. Although this species was anatomically similar to people today, archaeological and genetic evidence suggest that a further development sometime between 80,000 and 50,000 years ago produced the first behaviorally modern humans, with the intellectual and social capabilities that we have.

There is no scholarly consensus on when, why, or how humans developed the capacity to speak. In the absence of tangible evidence, this question has even been labeled "the hardest problem in science." Assuming that the shape of the throat and low position of the larynx are essential to vocalizing a wide range of sounds, it ought to be relevant that these features were still evolving in *Homo habilis* and *Homo erectus*. Some scholars link the development of language in the fullest sense to the period around 70,000 years ago when *Homo sapiens* began to migrate out of Africa and employed a larger, more sophisticated set of tools that can be sorted into functional categories.

This slow but remarkable process of physical evolution, which distinguished humans from other primates, was one part of what was happening. Equally remarkable was the way in which humans were extending their habitat.

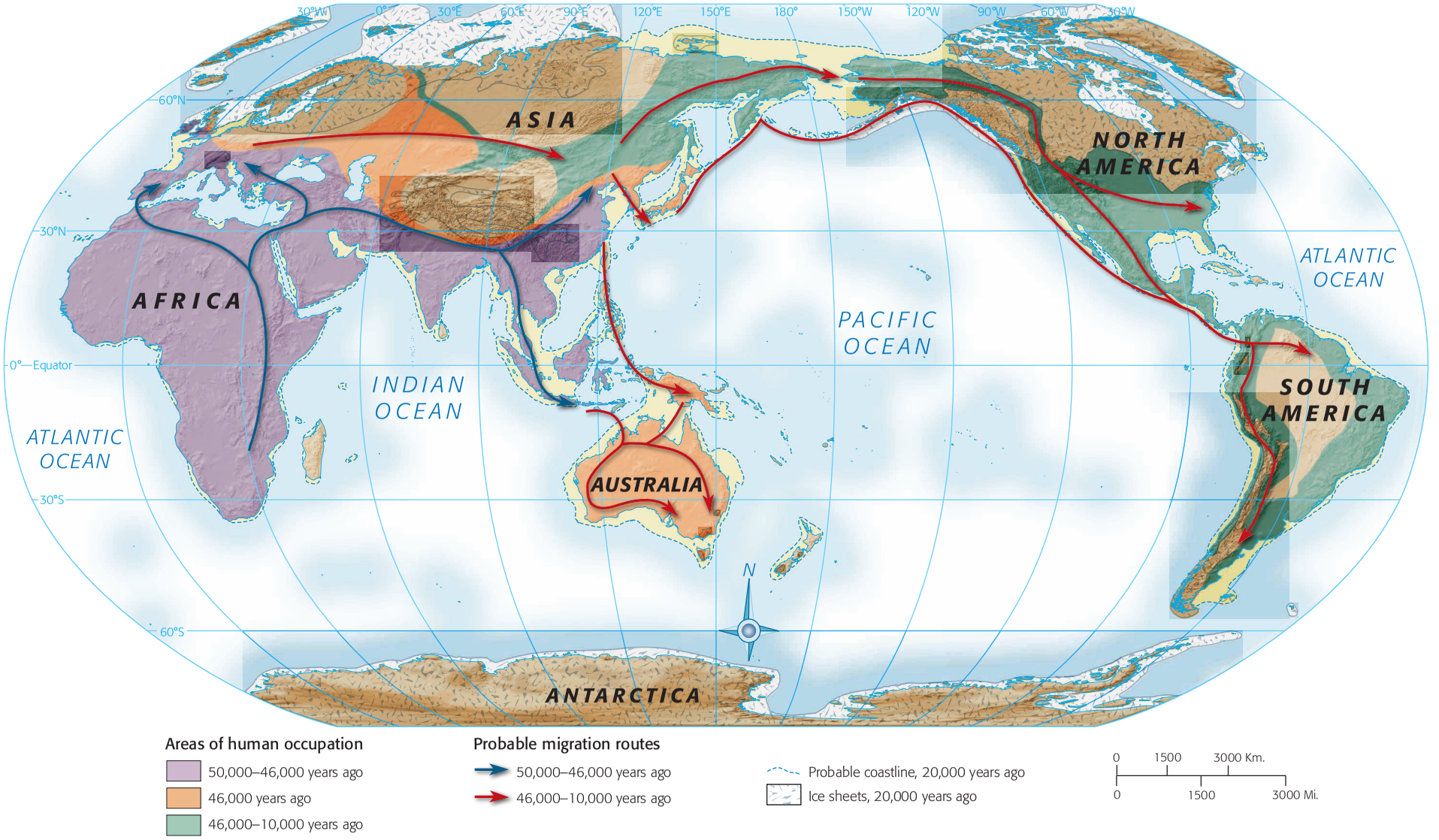
Homo naledi A recently discovered early hominid with a puzzling mix of primitive and more advanced features.

Homo sapiens The current human species. It evolved in Africa sometime between 400,000 and 100,000 years ago.

1-1c Migrations from Africa

Early humans first expanded their range in eastern and southern Africa. Then they ventured out of Africa, perhaps following migrating herds of animals or searching for more abundant food supplies in a time of drought. The reasons are uncertain, but the end results are vividly clear: humans successfully colonized diverse environments, including deserts and arctic lands (see Map 1.1). This dispersal demonstrates early humans' talent for adaptation.

Homo erectus was the first human species to inhabit all parts of Africa and to be found outside Africa. Java man and Peking man were members of this species. At that time, Java was



MAP 1.1 **Human Dispersal to 10,000 Years Ago** Early migrations from Africa into southern Eurasia were followed by treks across land bridges during ice ages, when giant ice sheets lowered ocean levels. Boats may also have been employed.

Which regions of human settlement could only have been reached by boat?

John Reader/Science Source

▲ **Fossilized Footprints** Archaeologist Mary Leakey (shown at top) found these remarkable footprints of a hominid adult and child at Laetoli, Tanzania. The pair had walked through fresh volcanic ash that solidified after being buried by a new volcanic eruption. Dated to 3.5 million years ago, the footprints are the oldest evidence of bipedalism yet found.

not an island but was part of the Southeast Asian mainland. During the Pleistocene, massive glaciers of frozen water spread out from the poles and mountains. At their peak such glaciers covered a third of the earth's surface and contained so much frozen water that ocean levels were lowered by over 450 feet (140 meters), exposing land bridges between many places now isolated by water (see Map 1.1).

DNA and fossil evidence suggest that *Homo sapiens* also first evolved in Africa. The ancestral group from which all modern humans are descended may have comprised as few as 5,000 individuals. From this population, a band of several hundred people initially moved out of northeast Africa, crossing the strait between the horn of Africa and the Arabian peninsula, sometime between 80,000 and 50,000 years ago, and their descendants rapidly spread across the planet (although some scientists dispute this "African Genesis" and hold that distinct groups of *Homo sapiens* evolved from *Homo erectus* populations in Africa, Europe, China, and Southeast Asia).

Recent excavations and DNA analysis have shown that early modern humans co-existed and interbred with other species of *Homo* that are now extinct: Neanderthals and Denisovans (whose bone fragments were recently discovered in Siberia). The small and small-brained *Homo floresiensis*, whose remains were recently excavated in Indonesia, only died out about 12,000 years ago.

Ultimately modern humans displaced older human populations, probably because they were better able to survive environmental conditions in the Ice Age, though some scholars believe the Neanderthals were absorbed into the *Homo sapiens* population through interbreeding.

The Great Ice Age enabled modern humans to penetrate into the Americas and even the Arctic. During glacial periods, people would have been able to cross a land bridge from Siberia to Alaska, perhaps beginning around 18,000 BCE, though some scholars believe that the first migrations occurred as early as 35,000 to 25,000 BCE. Scholars are also investigating the possibility that people from Asia initially explored and settled the western coast of North America by boat, but there is little archaeological evidence because these areas were submerged when the glaciers melted and sea levels rose. Over thousands of years the population of the Americas grew and spread throughout the hemisphere, penetrating southern South America by 10,500 BCE. As they spread, these humans adapted to environments that included polar extremes, tropical rain forests, and high mountain ranges as well as deserts, woodlands, and prairies.

About 46,000 years ago, modern humans, traveling by boat from Java, colonized New Guinea and Australia when both were part of a single landmass, and others crossed the land bridge then existing between the Asian mainland and Japan. When global temperatures rose and the glaciers melted, submerging the land bridges and increasing the extent of ocean between Southeast Asia and Australia, the peoples of the Western Hemisphere and Australia were virtually isolated from the rest of the world for at least 15,000 years.

As populations migrated, they underwent minor evolutionary changes that helped them adapt to extreme environments. One such change was in skin color. The deeply pigmented

skin of today's indigenous inhabitants of the tropics (and presumably of all early humans) reduces harmful effects of the harsh tropical sun such as sunburn and skin cancer. At some point between 20,000 and 5,000 years ago, pale skin became characteristic of Europeans living in northern latitudes with far less sunshine, especially during winter months. The loss of pigment enabled their skin to produce more vitamin D from sunshine.

As distinctive as skin color seems, it represents a very minor biological change. What is far more remarkable is that widely dispersed human populations vary so little in their genetic makeup. Whereas other species need to evolve physically to adapt to new environments, modern humans have been able to adapt technologically, changing their eating habits and devising new forms of tools, clothing, and shelter. As a result, human communities have become culturally diverse while remaining physically homogeneous.

Section Review

- Nineteenth-, twentieth-, and twenty-first-century discoveries of hominid fossil remains upset traditional beliefs about human origins.
- In Charles Darwin's theory of evolution, natural selection of traits that promote survival and reproduction accounts for the gradual development of modern humans from primate ancestors.
- Bipedalism, a large brain, and a lower location of the larynx that enables speech are advantages that humans have over other primates.
- Africa is the place of origin of the earliest hominids, about 7 million years ago, and of modern humans between 200,000 and 100,000 years ago. Sometime between 80,000 and 50,000 years ago they began to migrate to the other continents, using land bridges during glacial periods with low sea levels.

1-2 Technology and Culture in the Ice Age

How did the evolution of early humans enable them to adapt to new environments during the Great Ice Age?

Evidence of early humans' splendid creative abilities came to light in 1940 near Lascaux in southern France. Youths who stumbled onto the entrance to a vast underground cavern found its walls covered with paintings of animals, including many that had been extinct for thousands of years. Other ancient cave paintings have been found in Spain, Africa, Australia, and elsewhere. The artistic quality of ancient cave art is vivid evidence that the biologically modern people who made such art were intellectually modern as well (see Diversity & Dominance: Cave Art).

The production of similar art and specialized tools over wide areas and long periods of time demonstrates that skills and ideas were deliberately passed along within and between societies. These learned patterns of action and expression constitute **culture**. Culture includes both material objects, such as dwellings, clothing, tools, and crafts, and nonmaterial values, beliefs, and languages. While some animals also learn new ways, their activities are determined primarily by inherited instincts. Among humans, instincts are less important than the cultural traditions that each generation learns from its elders.

1-2a Food Gathering and Stone Tools

When archaeologists examine the remains of ancient human sites, the first thing that jumps out at them is the abundant evidence of human toolmaking. Because the tools that survive are mostly made of stone, the extensive period of history from the appearance of the first fabricated stone tools around 2.6 million years ago until the appearance of metal tools around 6,000 years ago has been called the **Stone Age**.

The name can be misleading because not all tools were made of stone. Early humans also made useful objects out of bone, skin, wood, plant fibers, and other materials less likely than stone to survive the ravages of time. Early scholars recognized two phases of the Stone Age: the **Paleolithic (pay-lee-oh-LITH-ik)** (Old Stone Age), down to 8000 BCE, and the **Neolithic (NEE-OH-LITH-IK)** (New Stone Age), which is associated with the rise of agriculture. Modern scientists have developed more complex schemes with many subdivisions.

Most early human activity centered on gathering food. Like the australopithecines, early humans depended heavily on vegetable foods such as leaves, seeds, and grasses, but during the Ice Age the consumption of highly nutritious animal flesh increased. Moreover, unlike australopithecines, humans regularly made tools. These two changes—increased meat eating and toolmaking—appear to be closely linked.

culture Socially transmitted patterns of action and expression.

Stone Age The historical period characterized by the production of tools from stone and other nonmetallic substances.

Paleolithic The period of the Stone Age associated with the evolution of humans.

Neolithic The period of the Stone Age associated with the ancient Agricultural Revolution(s).

Cave Art

Were the people who lived tens of thousands of years ago different from people today? Biologically, members of *Homo sapiens* have not changed much over time. But what were our ancestors like inside—in their thoughts, imaginations, and emotions? Did their eyes see beauty, their ears hear music, and their minds wonder at the meaning of the world around them and the celestial bodies above them? One way to approach this difficult question is to look at the earliest art.

The oldest recognizable human art, a carefully crosshatched bone from Blombos Cave east of Cape Town, South Africa, dates from over 70,000 years ago. When the first painted cave was discovered at Altamira in Spain in the later nineteenth century, many people refused to believe that the images were the work of prehistoric people. The quality of the art was too high, the skill of the artists too impressive, to reconcile with conventional conceptions of "cavemen." Scientists calculated that the paintings in Lascaux, the most famous of the caves, discovered in southwestern France in 1940, date to about 15,000 BCE. Then in 1994 the discovery of Chauvet **(sho-VAY)** Cave, in southeastern France, pushed back the evidence for painting by humans to a much earlier time. Jean-Marie Chauvet and two companions discovered a small cliffside entrance into a vast cave complex. The original entrance to the cave had been closed off long before by a rock slide, thereby sealing and preserving not only the magnificent paintings on the walls of the cave, but also animal bones, human and animal footprints, and other artifacts. The Chauvet Cave paintings are currently dated to between 30,000 and 35,000 years ago. The cave has been put off-limits by the French government to preserve it from human and environmental damage, and even scholars are only allowed in for short periods of time. (However, a nearby replica of the cave was opened for visitors in 2015.)

The prehistoric artists of Chauvet lived during the Ice Age, when glaciers covered much of France. The Ardèche River Gorge, where the cave is located, was teeming with life—modern humans, Neanderthals, and animals of all sorts, both those that humans hunted and dangerous predators. The cave paintings depict the animals of that epoch: cave lions, cave bears, rhinoceroses, wild horses, bison, reindeer, aurochs (wild oxen), and mammoths. The only representations of humans are the silhouettes of hands, made by blowing paint around them (experts can identify one particular individual whose handprint is found at several cave locations by a distinctively curling little finger), and a large stalactite projection, near the back of the cave, painted to represent the lower half of a woman. Scholars have noted the similarity of this figure to a multitude of small female statuettes, often called Venuses (after the Roman goddess of sex and love) because of the exaggerated genitalia, found throughout Europe from as early as 35,000 to as late as 11,000 years ago. This similarity suggests a continuity in representation throughout the Paleolithic and, presumably, a continuity in the thoughts behind it, that may have to do with promoting reproduction.

HIP/Art Resource, NY

▲ **Painted Animals in Chauvet Cave, France**

Specimens of crude early tools found in the Great Rift Valley of eastern Africa reveal that *Homo habilis* made tools by chipping flakes off the edges of volcanic stones. The razor-sharp edges of such flakes are highly effective for skinning and butchering wild animals.

Lacking the skill to hunt and kill large animals, small-brained *Homo habilis* probably obtained animal protein by scavenging meat from kills made by animal predators or resulting from accidents. This species probably used large stone "choppers" for cracking open bones to get at the nutritious marrow. The fact that such tools are found far from the volcanic outcrops where they were quarried suggests that people carried them long distances for use at kill sites and camps.

Members of *Homo erectus* were also scavengers, but their larger brains made them more clever. They made more effective tools for butchering large animals, including a hand ax formed by removing chips from both sides of a stone to produce a sharp outer edge. The hand ax was an efficient multipurpose tool, suitable for skinning and butchering animals, for scraping skins clean for use as clothing and mats, for sharpening wooden tools, and for digging up edible roots. Since a hand ax can also be hurled accurately for nearly 100 feet (30 meters), it might also have been used as a projectile to fell animals. *Homo erectus* even hunted elephants by driving them into swamps, where they became trapped and died.

The walls of the cave are not flat, but rather full of projections and indentations, and the artists have skillfully incorporated these natural features into the paintings, as well as etched the outlines of some figures to give them a startling three-dimensional quality. Besides having a rough sense of perspective, they used sophisticated techniques to represent motion and multiplicity, such as a bison with eight legs to indicate rapid motion. Sometimes new figures were painted over earlier figures, suggesting that the activity of painting may have gone on over a long period of time.

No traces of human habitation have been found in the cave, so it evidently had a different purpose. One can only marvel at the effort that must have gone into illuminating the deep recesses of the cave so that the artists could see what they were doing. There are black smudge marks on the walls where torchbearers wiped off excess carbon to keep the torches lit. There is also an altar-like stone platform on which a cave bear's skull had been purposefully set.

The scene reproduced here, depicting a woolly rhinoceros, aurochs, and wild horses, shows the skill and techniques of the artists and the variety of subject matter, and it has been noted that the artists cleverly incorporated clefts, bumps, and other natural features of the rock into their tableau.

Why did the prehistoric artists of Chauvet and other caves draw what they did? And why in caves? It is a huge challenge for us to understand the meaning and purpose of these cave paintings. Prehistory is, by definition, a time before there were written texts that can tell us about ancient humans' lives and thoughts. For such periods we primarily depend on archaeology, but while excavated artifacts can tell us about the material culture of a society—their tools, weapons, jewelry, food, burial practices, and the physical spaces in which they operated—it is much harder to infer from physical objects the social institutions, customs, beliefs, and values of the people who made and used them. However, we can regard these paintings as a kind of text because the artists were trying to communicate something to their fellows. Modern scholars, operating across a vast cultural divide between us and the Paleolithic people of Chauvet, can only speculate about the meaning of the paintings to the artists and their contemporaries and the cultural function of the caves.

Commentators often start with the context in which the art was made. Given that humans did not live in Chauvet Cave, what might have been its function? It was no accident that they went to such trouble to work inside dark caves that could be illuminated only with crude torches. However, they probably did not do so with the goal of protecting and preserving their art for tens of thousands of years. Rather, the artists may have gone deep underground "to feel the power of the earth"—they may have believed that the wild animals and the earth itself were full of spiritual energy. (Indeed, many of the archaeologists who have worked in Chauvet and other caves have commented on the mysterious, spiritual feeling induced by being deep inside the earth.) It is thus possible that the artists were the spiritual guides of their communities, and the decorated caverns were holy places where religious ceremonies were performed and where those present would have had powerful religious experiences.

One must also consider the subject matter of the paintings, the preponderance of animals, and the absence (with the exceptions already noted) of humans. The animals represented include both those that humans hunted and those they did not, and the artists had a fund of knowledge about the appearance, movement, and behavior of those animals, derived, no doubt, from close observation. It has been suggested that ancient cave art may have expressed the mystical relationship of humans with the animals with whom they shared the world. Perhaps humans could absorb something of the power of the bears, antelope, bison, or other animals depicted in the caves by viewing or touching them.

Questions for Analysis

1. How persuasive are these explanations of the function of the painted caves and the meaning of the paintings? Can you think of alternative explanations?
2. Is there anything in the depiction of the animals that suggests whether the artists were in awe of them, felt superior to them, or felt at one with them? What might be the significance of the fact that not all the animals depicted were ones that people hunted to eat?
3. What comparisons can you make between this cave painting and the rock engraving of cattle that opens this chapter?

Members of *Homo sapiens* were far more skillful hunters. Using their superior intelligence and an array of finely made tools, they tracked and killed large animals. Sharp stone flakes chipped from carefully prepared rock cores were used in combination with other materials. Attaching a stone point to a wooden shaft made a spear. Embedding several sharp stone flakes in a bone handle produced a sawing tool.

Indeed, members of *Homo sapiens* were so successful as hunters that they may have caused a series of ecological crises. Between 40,000 and 13,000 years ago the giant mastodons and mammoths gradually disappeared from Africa, Southeast Asia, and northern Europe. In North America around 11,000 years ago, three-fourths of the large mammals became extinct, including giant bison, camels, ground sloths, stag-moose, giant cats, mastodons, and mammoths. In Australia there was a similar event. However, since these extinctions occurred during severe cold spells at the end of the Ice Age, it is difficult to distinguish the effects of climate change and human predation.

Despite the evidence for hunting, anthropologists do not believe that early humans depended primarily on meat for their food. The few surviving present-day **foragers** (hunting and food-gathering peoples) in Africa derive the bulk of their day-to-day nourishment from wild vegetable foods, with meat reserved for feasts. The same was probably true for Stone Age peoples, even though tools for gathering and processing vegetable foods have left few traces

foragers People who support themselves by hunting wild animals and gathering wild edible plants and insects.

because they were made of perishable materials. Ancient humans would have used skins and mats woven from leaves for collecting fruits, berries, and wild seeds. They would have dug edible roots out of the ground with wooden sticks.

Both meat and vegetables become tastier and easier to digest when they are cooked. The first cooked foods were probably found by accident after wildfires. Humans may have been setting fires deliberately as early as 1.4 million years ago and maintaining hearths around 500,000 years ago. However, only with the appearance of clay cooking pots some 18,000 years ago in East Asia is there hard evidence of cooking.

1-2b Gender Roles and Social Life

Researchers have studied the behavior and organization of nonhuman primates for clues about very early human society. Gorillas and chimpanzees live in groups consisting of several adult males and females and their offspring. Status varies with age and sex, and a dominant male usually heads the group. Sexual unions between males and females generally do not result in long-term pairing. Instead, the strongest ties are those between a female and her children and among siblings. Adult males are often recruited from neighboring bands.

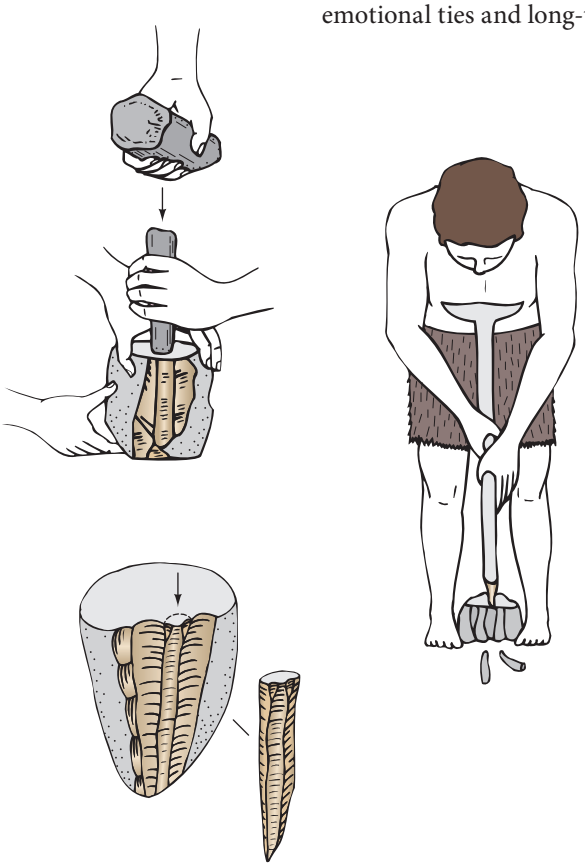
Very early human groups likely shared some of these primate traits, but long before the advent of modern *Homo sapiens* the two-parent family would have been common. We can only guess how this change developed, but it is likely that physical and social evolution were linked. Big-headed humans with large brains have to be born in a less mature state than other mammals so that they can pass through the narrow birth canal. Other large mammals are mature at two or three years of age; humans are not able to care for themselves until the age of twelve to fifteen. The need of human infants and children for much longer nurturing makes care by mothers, fathers, and other family members a biological imperative.

The human reproductive cycle also became unique. In many other species sexual contact is biologically restricted to a special mating season of the year or to the fertile part of the female's menstrual cycle. Moreover, among other primates the choice of mate is usually not a matter for long deliberation. To a female baboon in heat any male will do, and to a male baboon any receptive female is a suitable sexual partner. In contrast, adult humans can mate at any time and are much choosier about their partners. Once they mate, frequent sexual contact promotes deep emotional ties and long-term bonding.

An enduring bond between human parents made it much easier for vulnerable offspring to receive the care they needed during the long period of their childhood. Working together, mothers and fathers could nurture dependent children of different ages at the same time, unlike other large mammals, whose females must raise their offspring nearly to maturity before beginning another reproductive cycle. Spacing births close together also would have enabled humans to multiply more rapidly than other large mammals.

Researchers studying present-day foragers infer that Ice Age women would have done most of the gathering and cooking (which they could do while caring for small children). Older women past childbearing age would have been the most knowledgeable and productive food gatherers. Men, with stronger arms, would have been more suited than women to hunting, particularly for large animals. Since the male hunters will only occasionally have succeeded in bringing down their prey, while the women gatherers provided the bulk of the band's daily diet, it is likely that women held a respected position in early human societies.

All recent foragers have lived in small bands. The community has to have enough members to defend itself from predators and



◀ **Making Stone Tools** About 35,000 years ago the manufacture of stone tools became highly specialized. Small blades chipped from a rock core were mounted in a bone or wooden handle. Not only were such composite tools more varied than earlier all-purpose hand axes, but the small blades also required fewer rock cores—an important consideration where suitable rocks were scarce. From Jacques Bordaz, Tools of the Old and New Stone Age. Copyright 1970 by Jacques Bordaz. Redrawn by permission of Addison-Wesley Educational Publishers, Inc.

divide responsibility for collection and preparation of foods. However, too many members would exhaust the food available in its immediate vicinity. The band has to move at regular intervals to follow migrating animals and take advantage of seasonally ripening plants in different places. Archaeological evidence from Ice Age campsites suggests that early humans, too, lived in highly mobile bands.

1-2c Hearths and Cultural Expressions

Because frequent moves were necessary, early hunter-gatherers did not lavish much time on housing. Natural shelters under overhanging rocks or in caves were favorite camping places to which bands returned at regular intervals. Where the climate was severe or where natural shelters did not exist, people erected huts of branches, stones, bones, skins, and leaves. Large, solid structures were common in fishing villages that grew up along riverbanks and lakeshores, where the abundance of fish permitted people to occupy the same site year-round.

Animal skin cloaks were probably an early form of clothing. Although the oldest evidence of fibers woven into cloth dates from about 26,000 years ago, the appearance of the body louse around 70,000 years ago has been linked to people beginning to wear close-fitting garments. An "Iceman" from 5,300 years ago, whose frozen remains were found in the European Alps in 1991, was wearing many different garments made of animal skins sewn together with cord fashioned from vegetable fibers and rawhide (see Environment & Technology: The Iceman).

Although accidents, erratic weather, and disease might take a heavy toll on a foraging band, day-to-day existence was probably not particularly hard or unpleasant. Studies suggest that, in plant- and game-rich areas, obtaining necessary food, clothing, and shelter would have occupied only from three to five hours a day. This would have left a great deal of time for artistic endeavors, toolmaking, and social life.

The foundations of science, art, and religion were built during the Stone Age. Basic to human survival was extensive knowledge about the natural environment. Gatherers learned which local plants were best for food and when they were available, and hunters gained intimate knowledge of the habits of game animals. People learned how to use plant and animal parts for clothing, twine, building materials, and dyes; minerals for paints and stones for tools; as well as natural substances effective for medicine and consciousness altering. It is very likely that the transmission of such knowledge involved verbal communication, even though direct evidence for language appears only in later periods.

Early music and dance have left no traces, but there is abundant evidence of painting and drawing (see Diversity & Dominance: Cave Art). Because many cave paintings feature wild animals that were hunted for food, some believe they were meant to record hunting scenes or formed part of magical and religious rites to ensure successful hunting. However, the recently discovered Chauvet Cave in southern France features rhinoceroses, panthers, bears, and other animals that probably were not hunted. Other drawings include people dressed in animal skins and smeared with paint. In many caves there are stencils of human hands. Are these the signatures of the artists or the world's oldest graffiti? Some scholars suspect that other marks in cave paintings and on bones from this period may represent efforts at counting or writing. Other theories suggest that cave and rock art represent concerns with fertility, efforts to educate the young, or elaborate mechanisms for time reckoning.

Without written texts it is difficult to know about the religious beliefs of early humans. Sites of deliberate human burials from about 100,000 years ago give some hints. The fact that an adult was often buried with stone implements, food, clothing, and red-ochre powder suggests that early people revered their leaders, relatives, and companions enough to honor them after death and may imply a belief in an afterlife where such items would be useful.

Today we recognize that the Old Stone Age, whose existence was scarcely dreamed of two centuries ago, was a formative period. Important in its own right, it also laid the foundation for major changes ahead as human communities passed from being food gatherers to food producers.

Section Review

- Unlike other animals, humans have used the learned patterns of culture to adapt to and occupy very diverse environments.
- Early humans made tools, foraged for food, and hunted. They found natural shelters or built temporary shelters, and they provided themselves with clothing.
- In early hunter-gatherer societies, women gathered the plant foods that provided most of the band's diet, while men did the hunting. The two-parent family offered children protection and a long period to mature.
- This lifestyle left them leisure to develop art and religion. Although the remains of their art and religion are difficult to interpret, it is clear that early modern humans had the mental capabilities that we have.

Environment & Technology
The Iceman

The discovery of the well-preserved remains of a man at the edge of a melting glacier in the European Alps in 1991 provided detailed information about everyday technologies of the fourth millennium BCE. Not just the body of this "Iceman" was well preserved, but also his clothing, his tools, and even the food in his stomach survived in remarkably good condition.

Dressed from head to toe for the cold weather of the mountains, the fifty-year-old man was wearing a fur hat fastened under the chin with a strap, a vest of different-colored deerskins, leather leggings and loincloth, and a padded cloak made of grasses. His calfskin shoes were also padded with grass for warmth and comfort. The articles of clothing had been sewn together with fiber and leather cords. He carried a birch-bark drinking cup.

In a leather fanny pack he carried small flint tools for cutting, scraping, and punching holes, as well as some tinder for making a fire. He also carried a leather quiver with flint-tipped arrows, but his 6-foot (1.8-meter) bow was unfinished, lacking a bowstring. In addition, he had a flint knife and a tool for sharpening flints. His most sophisticated tool, indicating the dawning of the age of metals, was a copper-bladed ax with a wooden handle.

His death was violent, caused either by a small arrowhead lodged in his shoulder or a blow to the head. In his stomach, researchers found the remains of the meat-rich meal he had eaten not long before he died.

▲ **The Iceman** This is an artist's rendition of what the Iceman might have looked like. Notice his clothing and tools, remarkable evidence of the technology of his day.
MARKA/Alamy Stock Photo

Questions for Analysis

1. Based on his clothing and the food in his stomach, what kinds of animals did the Iceman encounter and make use of?
2. What were the purposes of the various tools and weapons found with the Iceman?
3. What do you think the Iceman was doing so high up in the mountains?

1-3 The Agricultural Revolutions

After nearly 2 million years of physical and cultural development, how did human communities in different parts of the world learn to manipulate nature through agriculture and the domestication of animals?

For most of human existence people ate only wild plants and animals. But around 10,000 years ago global climate changes seem to have induced some societies to enhance their food supplies with domesticated plants and animals. More and more people became food producers over the following millennia. Although hunting and gathering did not disappear, this transition from foraging to food production was one of the great turning points in history because it fostered a rapid increase in population and greatly altered humans' relationship to nature (see Map 1.2).

Because agriculture arose in combination with new kinds of stone tools, archaeologists called this period the Neolithic, or New Stone Age, and the rise of agriculture the Neolithic Revolution. But that name can be misleading: first, stone tools were not its essential component, and second, it was not a single event but a series of separate transformations in different parts of the world. A better term is **Agricultural Revolutions**, which emphasizes that the central change was in food production and that agriculture arose independently in many places. In most cases agriculture included the domestication of animals as well as the cultivation of new food crops.

Agricultural Revolutions
The change from food gathering to food production that occurred between about 8000 and 2000 BCE. Also known as the Neolithic Revolution.

1-3a The Transition to Plant Cultivation

Food gathering gave way to food production in stages spread over hundreds of generations. The process may have begun when forager bands, returning year after year to the same seasonal camps, deliberately scattered the seeds of desirable plants in locations where they

▲ **A Neolithic House** This reconstruction of an early permanent human habitation has a single door and no windows. Simple dwellings were constructed of mud brick over a timber frame or of wattle and daub, a lattice of branches covered with a sticky composite of mud, straw, and other materials. The roof is thatched, a layering of dried vegetation that sheds water. Herv Champollion/akg-images/Newscom

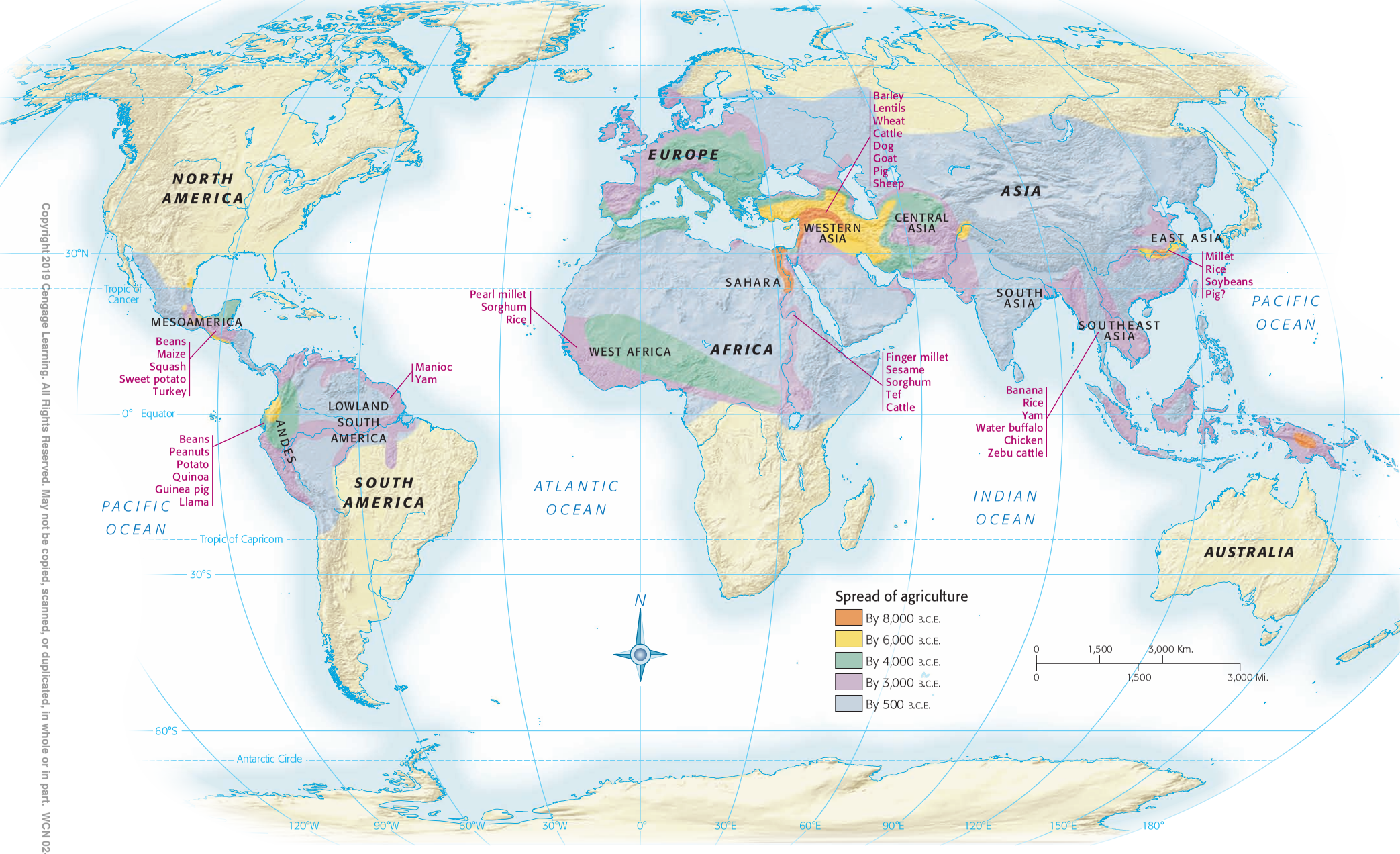
would thrive and discouraged the growth of competing plants by clearing them away. Such semicultivation could have supplemented food gathering for many generations. Eventually, families choosing to concentrate on food production would have settled permanently near their fields.

The presence of new, specialized tools for agriculture first alerted archaeologists to the beginning of a food production revolution. These included polished stone heads to work the soil, sharp stone chips embedded in bone or wooden handles to cut grain, and stone mortars to pulverize grain. Since stone axes were not very efficient for clearing away shrubs and trees, farmers used fire to get rid of unwanted undergrowth (the ashes were a natural fertilizer).

The transition to agriculture occurred first in the Middle East. By 8000 BCE humans, by selecting the highest-yielding strains, had transformed certain wild grasses into the domesticated grains now known as emmer wheat and barley. They also discovered that alternating the cultivation of grains and *pulses* (plants yielding edible seeds such as lentils and peas) helped maintain soil fertility. Women, the principal gatherers of wild plant foods, had the expertise to play a major role in this transition to plant cultivation, but the heavy work of clearing the fields would have fallen to men.

Plants domesticated in the Middle East spread to Greece as early as 6000 BCE, to the light-soiled plains of central Europe and along the Danube River shortly after 4000 BCE, and then to other parts of Europe over the next millennium (see Map 1.2). Early farmers in Europe and elsewhere practiced shifting cultivation, also known as swidden agriculture. After a few growing seasons, the fields were left *fallow* (abandoned to natural vegetation) for a time to restore their fertility, and new fields were cleared nearby. From around 2600 BCE people in central Europe began using ox-drawn wooden plows to till heavier and richer soils.

Wheat and barley could not spread farther south because the rainfall patterns in most of Africa were unsuited to their growth. Instead, separate Agricultural Revolutions took place in Saharan and sub-Saharan Africa, beginning almost as early as in the Middle East. During a particularly wet period after 8000 BCE, people in what is now the eastern Sahara began to cultivate sorghum, a grain derived from wild grasses they had previously gathered. Over the next 3,000 years the Saharan farmers domesticated pearl millet, black-eyed peas, a kind of peanut, sesame, and gourds. In the Ethiopian highlands, farmers domesticated finger millet and a grain



MAP 1.2 Early Centers of Plant and Animal Domestication Many different parts of the world made original contributions to domestication during the Agricultural Revolutions that began about 10,000 years ago. Later interactions helped spread these domesticated animals and plants to new locations. In lands less suitable for crop cultivation, pastoralism and hunting remained more important for supplying food.

Why are most of the regions where crops were first domesticated relatively close to the Equator?

called tef. The return of drier conditions about 5000 BCE led many Saharan farmers to move to the Nile Valley, where the annual flooding of the river provided moisture for farming. People in the rain forests of equatorial West Africa domesticated rice and yams.

Rice, which thrives in warm and wet conditions, was probably first domesticated in the Yangzi River Valley in central China, possibly as early as 10,000 BCE, and by 3000 BCE it had made its way to Southeast Asia and India. In India several pulses domesticated about 2000 BCE (including hyacinth beans, green grams, and black grams) were cultivated along with rice.

The inhabitants of the American continents were domesticating other crops; potatos in the Andes, perhaps as early as 7000 BCE; by about 5000 BCE, maize **(mayz)**, or corn, in Mexico, manioc in Brazil and Panama, and beans and squash in Mesoamerica. By 4000 BCE, the inhabitants of Peru were developing quinoa **(kee-NOH-uh)**, a protein-rich seed grain. Insofar as their climates and soils permitted, other farming communities throughout the Americas adopted these crops, along with tomatoes and peppers.

1-3b Domesticated Animals and Pastoralism

The first domesticated animals were probably dogs descended from wolves that were used initially to help hunters track game and later to herd other domesticated animals as well as provide protection and companionship. There is much debate about the place, date, and process of domestication. Experts have argued for Siberia, the Middle East, and Europe as the site of the first domestication. The time of domestication may go back 30,000 years or more, though the first known burial of a dog with a human—a sure sign of the relationship—is from around 14,000 BCE.

The domestication of animals expanded rapidly during the Neolithic period, as other animals were domesticated to provide meat, milk, and energy. Refuse heaps outside some Middle East villages during the centuries after 7000 BCE show that sheep and goat bones gradually replaced gazelle bones. As wild sheep and goats scavenged for food scraps around villages, the tamer animals probably accepted human control and protection in exchange for a ready supply of food. Selective breeding for desirable characteristics such as high milk production and long wooly coats eventually led to distinct breeds of sheep and goats.

▼ **Ancient Dog Burial** This husky-like dog, buried 7,000 years ago in Siberia, was interred along with, and in the same manner as, humans. This, and the fact that he ate the same food as humans, suggests that he was seen as a companion and helper. Skeletal damage has also been interpreted as showing that he carried heavy loads and may have been repeatedly injured on hunts. Vladimir Bazaliiskii/Robert Losey/Sandra Garvie-Lok/Mietje Germonpre/Jennifer Leonard/Andrew Allen/Anne Katzenberg/ Mikhail Sablin

Elsewhere, other animal species were domesticated during the centuries before 3000 BCE: wild cattle in northern Africa or the Middle East; donkeys in northern Africa; water buffalo in China; and humped-back Zebu **(ZEE-boo)** cattle in India. Varieties of domesticated animals spread from one region to another.

Once cattle became tame enough to be yoked to plows, they became essential to grain production. In addition, animal droppings provided valuable fertilizer. In the Americas, however, comparatively few species of wild animals were suitable for domestication, and domesticated animals could not spread from elsewhere because the land bridge to Asia had been submerged by raised sea levels. In the Western Hemisphere, therefore, domesticated llamas provided transport and wool, while guinea pigs and turkeys furnished meat. Hunting remained the most important source of meat for Amerindians.

In the more arid parts of Africa and in some regions of western and Central Asia, pastoralism, a way of life dependent on large herds of small and large stock, predominated. As the Sahara approached its maximum dryness around 2500 BCE, pastoralists replaced farmers, who migrated southward (see Chapter 9). Moving their herds to new pastures and watering places throughout the year made pastoralists almost as mobile as foragers and discouraged accumulation of bulky possessions and construction of substantial dwellings. Early herders probably relied more heavily on milk than on meat, since killing animals reduced their herds. During wet seasons, they may also have done some hasty crop cultivation or bartered meat and skins for plant foods with nearby farming communities.

1-3c Agriculture and Ecological Crisis

Why did the Agricultural Revolutions occur? Some theories assume that people were drawn to food production by its obvious advantages, such as the promise of a secure food supply. It has recently been suggested that people in the Middle East might have settled down so they could grow enough grains to ensure themselves a ready supply of beer.

However, most experts believe that climate change drove people to abandon hunting and gathering in favor of agriculture or pastoralism. With the end of the Great Ice Age, the temperate lands became exceptionally warm between 6000 and 2000 BCE, the era when people in many parts of the world adopted agriculture. The precise nature of the crisis probably varied. Shortages of wild food in the Middle East caused by a dry spell or population growth may have prodded people to take up food production. Elsewhere, a warmer, wetter climate could turn grasslands into forest, reducing supplies of game and wild grains.

In many drier parts of the world, where wild food remained abundant, people did not take up agriculture. The inhabitants of Australia continued to rely exclusively on foraging until recent centuries. Many Amerindians in the arid grasslands from Alaska to the Gulf of Mexico hunted bison, others in the Pacific Northwest took up salmon-fishing, and east of the Mississippi River food gatherers thrived on abundant supplies of fish, shellfish, and aquatic animals. In Africa, in the equatorial rain forest and in the southern part of the continent, conditions favored retention of the older ways. The reindeer-based societies of northern Eurasia were also unaffected by the spread of farming.

Whatever the causes, the gradual adoption of food production transformed most parts of the world. A hundred thousand years ago there were fewer than 2 million people, and their range was largely confined to the temperate and tropical regions of Africa and Eurasia. The population may have fallen even lower during the last glacial epoch, between 32,000 and 13,000 years ago. Then, as the glaciers retreated and people took up agriculture, their numbers rose. World population may have reached 10 million by 5000 BCE and then mushroomed to between 50 million and 100 million by 1000 BCE.[1] This increase led to important changes in social and cultural life.

Section Review

- Around 10,000 years ago humans began to cultivate plants, selecting for those with the highest nutritional yield, and to domesticate animals. These Agricultural Revolutions arose in various parts of the world.
- Climate change at the end of the last Ice Age is probably the major reason for the switch from food gathering to food production.
- Agriculturalists gradually spread across much of the planet, but in certain environments pastoralism, the dependence of people on herd animals, prevailed.
- The more secure food supply made possible by agriculture led to a great increase in human population.

[1]Colin McEvedy and Richard Jones, *Atlas of World Population History* (New York: Penguin Books, 1978), 13–15.

1-4 Life in Neolithic Communities

What cultural and social consequences of sedentary agriculture differentiated life in the Neolithic period from the hunter-gatherer lifestyle of earlier periods?

Evidence that an ecological crisis may have driven people to food production has prompted a reexamination of the assumption that farmers enjoyed better lives than foragers. Modern studies demonstrate that food producers have to work much harder and for much longer periods than do food gatherers, clearing and cultivating land, guiding herds to pastures, and guarding them from predators.

Although early farmers were less likely to starve because they could store food between harvests, their diet was less varied and nutritious than that of foragers. Skeletal remains show that Neolithic farmers were shorter on average than earlier food-gathering peoples. Farmers were also more likely to die at an earlier age because people in permanent settlements were more exposed to diseases. Their water was contaminated by human waste; disease-bearing vermin and insects infested their bodies and homes; and they could catch new diseases from their domesticated animals.

1-4a The Triumph of Food Producers

So how did farmers displace foragers? Some researchers have envisioned a violent struggle between practitioners of the two ways of life; others have argued for a more peaceful transition. In most cases, farmers seem to have displaced foragers by gradual infiltration rather than by conquest.

The key to the food producers' expansion may have been the fact that their small surpluses gave them a long-term advantage in population growth by ensuring higher survival rates during times of drought or other crisis. Archaeologist Colin Renfrew argues that over a few centuries farming population densities in Europe could have increased by a factor of 50 to 100. As population rose, individuals who had to farm far from their native village would have formed a new settlement close to their fields. A steady, nonviolent expansion of only 12 to 19 miles (20 to 30 kilometers) a generation could have repopulated the whole of Europe between 6500 and 3500 BCE.[2] So gradual a process need not have provoked sharp conflicts with existing foragers, who simply could have stayed clear of the agricultural frontier or gradually adopted agriculture themselves. New studies that map genetic changes also attest to a gradual spread of agricultural people across Europe from southeast to northwest.[3]

The expanding farming communities were organized around kinship and marriage. *Nuclear families* (parents and their children) probably lived in separate households but felt solidarity with all those related to them by descent from common ancestors. These kinship units, known as lineages **(LIN-ee-ij)** or clans, acted together to defend their common interests and land. Some societies trace descent equally through both parents, but most give greater importance to descent through either the mother (matrilineal **[mat-ruh-LIN-ee-uhl]** societies) or the father (patrilineal **[pat-ruh-LIN-ee-uhl]** societies). It is important not to confuse tracing descent through women (matrilineality) with the rule of women (matriarchy **[MAY-tree-ahr-key]**).

1-4b Cultural Expressions

Kinship systems influenced early agricultural people's outlook on the world. Burials of elders might be occasions for elaborate ceremonies expressing their descendants' group solidarity. Plastered skulls found in the ancient city of Jericho **(JER-ih-koh)** (see Map 2.1) may be evidence of such early ancestor reverence or worship.

[2]Colin Renfrew, *Archaeology and Language: The Puzzle of Indo-European Origins* (New York: Cambridge University Press, 1988), 125, 150.

[3]Cavalli-Sforza, L. Luca, Paolo Menozzi, and Alberto Piazza, *The History and Geography of Human Genes* (Princeton, NJ: Princeton University Press, 1994).

A society's religious beliefs tend to reflect its relations to nature. The religion of food gatherers centered on sacred groves, springs, and wild animals, while pastoralists worshiped the sky-god who controlled the rains and guided their migrations. In contrast, the religion of many farming communities centered on the Earth Mother; since women bear children, a female deity was logically believed to be the source of all new life.

The worship of ancestors, gods of the heavens, and earthly nature and fertility deities varied from place to place, and many societies combined the different elements. A recently discovered complex of stone structures in the Egyptian desert that was in use by 5000 BCE includes burial chambers presumably for ancestors, a calendar circle, and pairs of upright stones that frame the rising sun at the summer solstice. The builders must have been deeply concerned with the cycle of the seasons and how they were linked to the movement of heavenly bodies. Other **megaliths** (meaning "big stones") were erected elsewhere. Observation and worship of the sun are evident at the famous Stonehenge site in England, constructed about 2000 BCE. Megalithic burial chambers dating from 4000 BCE are evidence of ancestor rituals in western and southern Europe. The early ones appear to have been communal burial chambers, erected by descent groups to mark their claims to farmland. In the Middle East, the Americas, and other parts of the world, giant earth burial mounds may have served similar functions.

Another fundamental contribution of the Neolithic period was the dissemination of the large language families that form the basis of most languages spoken today. The root language of the giant Indo-European language family arose around 5000 BCE, probably in the region north of the Black and Caspian Seas. Its spread to the south and west across Europe and south and east into Anatolia (modern Turkey), Iran, and the Indian subcontinent may have been the work of pioneering agriculturalists. In the course of this very gradual expansion, Celtic, Germanic, Romance, Slavic, Iranian, and Indian languages developed. Similarly, the Afro-Asiatic language family of the Middle East and northern Africa may have been the result of food producers' expansion, as might the spread of the Sino-Tibetan family in East and Southeast Asia.

1-4c Early Towns and Specialists

Most early farmers lived in small villages, but in some parts of the world a few villages grew into more densely populated towns that were centers of trade and specialized crafts. These towns had grander dwellings and ceremonial buildings, as well as large structures for storing surplus food until the next harvest. Farmers could make most of the buildings, tools, and containers they needed in their spare time, but in large communities some craft specialists devoted their full time to making products of unusual complexity or beauty.

megaliths Structures and complexes of very large stones constructed for ceremonial and religious purposes in Neolithic times.

Two early towns in the Middle East that have been extensively excavated are Jericho on the west bank of the Jordan River and Çatal Hüyük **(cha-TAHL hoo-YOOK)** in central Turkey

◀ The Stone Alignments at Carnac In the vicinity of the village of Carnac, in Brittany, France, over 3,000 stones were erected by the Neolithic population between 5000 and 3000 BCE. Especially intriguing are the so-called alignments of single stones (*menhirs*) that fan out for almost a mile. Some scholars think they served as an astronomical observatory, while others think they pointed to burials or sacred spaces. age fotostock/Alamy Stock Photo