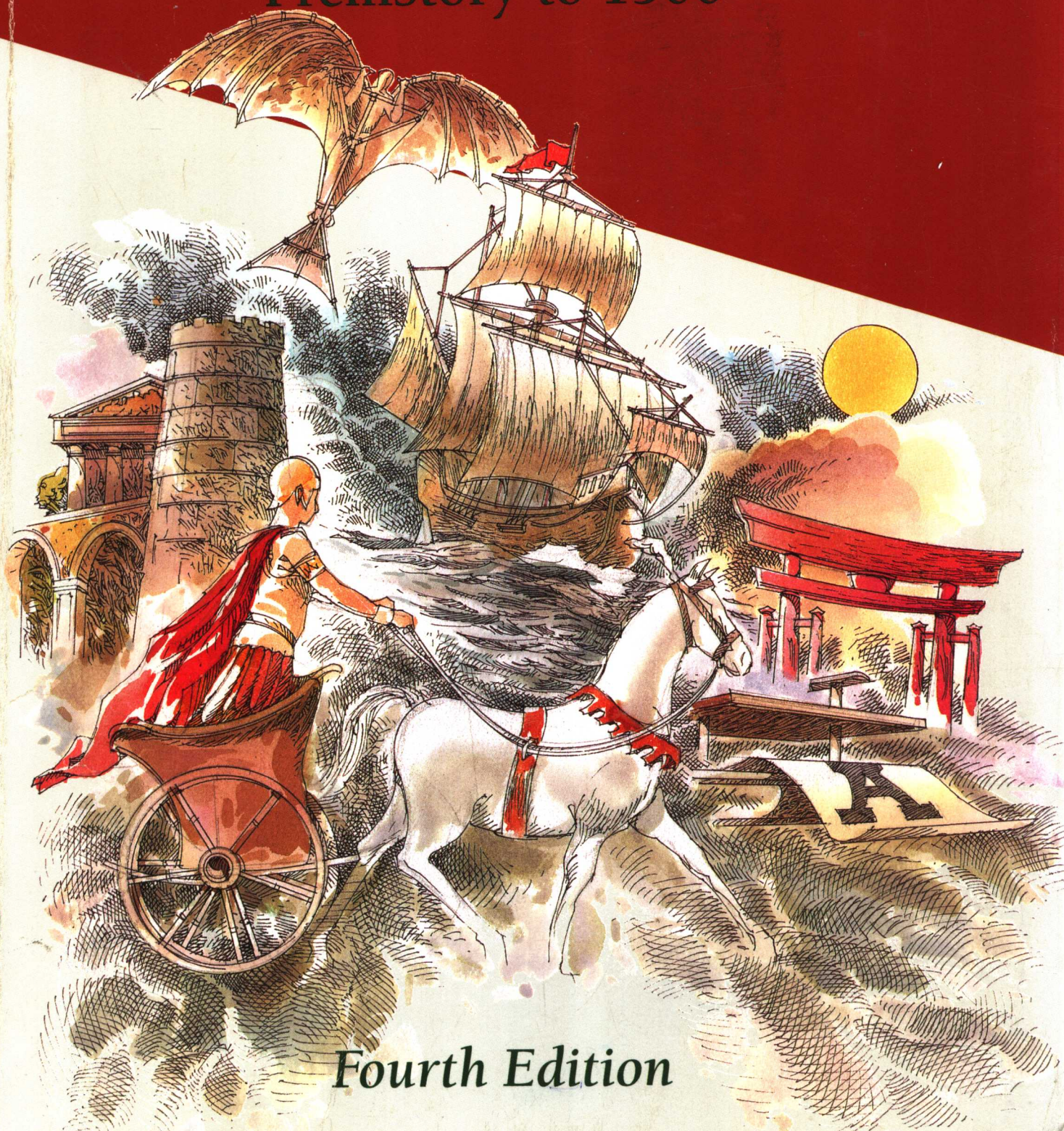


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WORLD HISTORY VOLUME I

Prehistory to 1500



Fourth Edition

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Fourth Edition

Printed in the United States of America

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David McComb
Colorado State University

Members of the Advisory Board are instrumental in the final selection of articles for each edition of Annual Editions. Their review of articles for content, level, currentness, and appropriateness provides critical direction to the editor and staff. We think you'll find their careful consideration well reflected in this volume.

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To the Reader

In publishing ANNUAL EDITIONS we recognize the enormous role played by the magazines, newspapers, and journals of the *public press* in providing current, first-rate educational information in a broad spectrum of interest areas. Within the articles, the best scientists, practitioners, researchers, and commentators draw issues into new perspective as accepted theories and viewpoints are called into account by new events, recent discoveries change old facts, and fresh debate breaks out over important controversies.

Many of the articles resulting from this enormous editorial effort are appropriate for students, researchers, and professionals seeking accurate, current material to help bridge the gap between principles and theories and the real world. These articles, however, become more useful for study when those of lasting value are carefully collected, organized, indexed, and reproduced in a low-cost format, which provides easy and permanent access when the material is needed.

That is the role played by *Annual Editions*. Under the direction of each volume's *Editor*, who is an expert in the subject area, and with the guidance of an *Advisory Board*, we seek each year to provide in each ANNUAL EDITION a current, well-balanced, carefully selected collection of the best of the public press for your study and enjoyment.

We think you'll find this volume useful, and we hope you'll take a moment to let us know what you think.

In recognition of the importance of international events, world history courses, next to those about the United States, have become the most popular history courses of the secondary schools. World history, moreover, has spread through higher education in the past decade and a half, and the first generation of scholars trained in world history is just emerging. Increasingly, the U.S. government and its citizens are caught up in a daily vortex of current concerns such as exported terrorism, warfare in Bosnia, environmental degradation in Brazil, viral outbreaks in Africa, nuclear developments in North Korea, and illegal migrations from Cuba and Mexico. Responsible citizens must become informed about international matters in order to act and vote intelligently about these events for the welfare of individuals, the nation, and the world. Thus, educators and others have become sensitive to the need for instruction about global matters in the classroom.

The organizational problems in world history are the traditional difficulties of scope and relevance. What should be included and what may be left out? How can diverse material be arranged to make sense of the past? In all history courses, choices must be made, particularly in surveys of the United States or of Western civilization. The broader the survey, the greater the level of abstraction. No one learns all about each country of Europe, or of each state, county, and city of the United States, with the hope that the pieces add up to some sort of comprehensible story. Instead, there is an emphasis upon ideas, technology, turning points, significant people, movements, and chronology. An effort is made by historians and teachers to place events in perspective, to illustrate cause and effect, and to focus upon what is important.

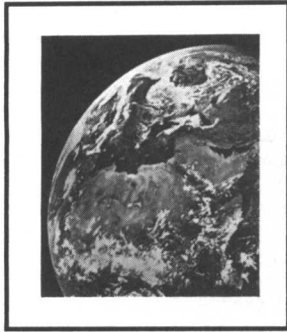
World history is no exception, but the range of choices is greater. There are simply more people, places, and events in the history of the world. There is more material and thus world history courses demand the broadest level of abstraction from the teachers and students. World historians, consequently, focus upon civilizations, cultures, global systems, and international affairs. Often they attempt cross-cultural comparisons, but some historiographical problems remain unsettled.

Probably the most difficult question involves periodization—how to divide history into time spans. In Western civilization courses the division of ancient, medieval, and modern works nicely. In world history, however, this division does not fit so neatly because other civilizations have evolved at different times. The development of medieval Europe makes little sense for Asia, the Middle East, Africa, or the Americas. World historians, nevertheless, have reached some consensus about the following: the two most important events in human history are the invention of agriculture and the industrial revolution; the thousand years before Columbus are significant because of the rise of Islam, development of global trading routes, evolution of civilization in Mesoamerica, and the power of China; and 1500 is a reasonable dividing point for history classes because of the European explorations and their consequences.

In this volume, I use a periodization of early civilizations to 500 B.C.E., later civilizations to 500 C.E., and the world from 500 C.E. to 1500 C.E. This is fairly traditional, but there are additional units on natural history and culture that include the earliest developments of humankind, the great religions, and exploration. Within the broad units can be found information about women, technology, the family, historiography, urbanization, sports, and other subjects. The *topic guide* is a useful index for this information. The articles were selected for readability, accuracy, relevance, interest, and freshness. They are meant to supplement a course, to provide depth, and to add spice and spark. The articles do not cover everything; that is impossible, of course. Sometimes older articles have been included to provide balance. You may know of some other articles that would do a better job. Please return the prepaid article rating form at the back of the book with your suggestions.

David McComb

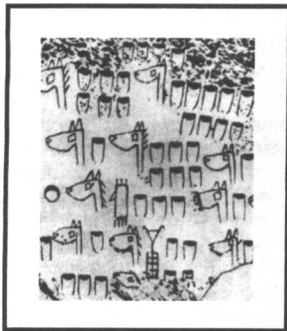
David McComb
Editor



Unit 1

Natural History: The Setting for Human History

Five articles discuss how the environment impacted on the shaping of early human society.



Unit 2

The Beginnings of Culture, Agriculture, and Urbanization

Six selections examine early milestones in the history of humankind: the origin of writing and numbers, the beginnings of agriculture, and urbanization.

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1. The Cosmic Calendar, Carl Sagan, <i>Realités</i> , July/August 1979.	6
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If the entire lifetime of the **universe** since the "big bang" is compressed into one calendar year, then recorded history amounts to the last 10 seconds of December 31. Our modern era, the time since 1500, amounts to a single tick of the cosmic clock.

2. The Evolution of Life on the Earth, Stephen Jay Gould, <i>Scientific American</i> , October 1994.	9
--	---

Humankind is a late arrival among living species on Earth and might not appear at all if it had to evolve all over again. **Life** is neither progressive nor predictable. Thousands of fortunate events created human beings, and the linkage might have been broken in many ways.

3. Climate and the Rise of Man, <i>U.S. News & World Report</i> , June 8, 1992.	16
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Climate has played a key role at almost every turning point in **human evolution**. For example, 65 million years ago a gradual cooling led to upright walking, and 10,000 years ago dry conditions led to the invention of agriculture. Future shifts in climate will probably lead to changes in the way humans live.

4. Frost and Found, Torstein Sjøvold, <i>Natural History</i> , April 1993.	21
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In 1991 in the Alps between Austria and Italy, the body of a late **stone age man**, about 5,300 years old, was found preserved in the ice and snow. The Iceman, as he became known, carried a flint knife, copper axe, long bow, and arrows. His clothing and equipment indicate that he may have been a shepherd, but grains of primitive wheat show that he was in contact with **agricultural communities**.

5. An Ice-Age Mystery, Evan Hadingham, <i>World Monitor</i> , March 1990.	24
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It is generally thought that modern human beings crossed the Bering Strait to populate the **Americas** about 12,000 years ago. Recent discoveries point to more than 30,000 years ago, but there is dental confirmation of the **Asian** heritage.

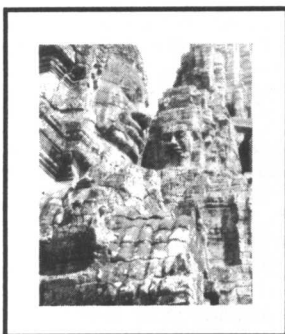
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6. Neptune's Ice Age Gallery, Jean Clottes and Jean Courtin, <i>Natural History</i> , April 1993.	30
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In 1985 in a Mediterranean Sea cave with a submerged opening, divers discovered 27,000-year-old **Paleolithic art** in the form of handprints. Drawings from a later period, 19,000 years ago, show horses, ibexes, bison, and sea animals. They represent not only the human impulse to produce art, but also the earliest form of nonspeoken **communication**.

7. Writing Right, Jared Diamond, <i>Discover</i> , June 1994.	33
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Literacy is considered one of the hallmarks of civilization. There are three basic strategies for writing: alphabets, logograms (signs for whole words), or a symbol for each syllable. Most writing systems combine the three strategies, such as **hieroglyphics**. According to linguists, **English** is the worst modern language for matching sounds with signs.



Unit 3

The Early Civilizations to 500 B.C.E.

Seven articles consider the growing diversity of human life as civilization evolved in the ancient world.

8. **The Origin of Numbers**, Tony Lévy, *The UNESCO Courier*, November 1993. 38

It seems that recognition of quantity is a human characteristic, and **number systems** developed in conjunction with writing. Various numeration patterns have been used, but the idea of a decimal used with a zero came from **India** and slowly became universal.

9. **Corn in the New World: A Relative Latecomer**, John Noble Wilford, *New York Times*, March 7, 1995. 43

The **cultivation of corn**, originally thought to have started 7,000 years ago, now seems to have begun only 4,700 years ago. New dating techniques indicate that the discovery of **agriculture** in the Western Hemisphere was 5,000 years behind the Middle East. Intermediate stages of agricultural development in the **New World**, however, are yet to be uncovered.

10. **The Eloquent Bones of Abu Hureyra**, Theya Molleson, *Scientific American*, August 1994. 47

Skeletons from Abu Hureyra, a neolithic site in northern Syria, reveal the **changes in everyday life** that came with the **agricultural revolution**. The advent of agriculture, although yielding good health, produced bone malformations for **women** who spent long hours grinding the grain on stones and fractured the teeth of everyone who ate the coarse, unsifted flour.

11. **How Man Invented Cities**, John Pfeiffer, *Horizon*, Autumn 1972. 53

Our ancestors were nomads, and it is a wonder that they learned to live in cities. **Urbanization** was unplanned and arose from a combination of population pressures and plentiful local food resources. This occurred in Asia, Mesoamerica, and the Middle East and was the beginning of **civilization**.

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12. **Old Tablet from Turkish Site Shows Early Spread of Culture**, John Noble Wilford, *New York Times*, November 9, 1993. 60

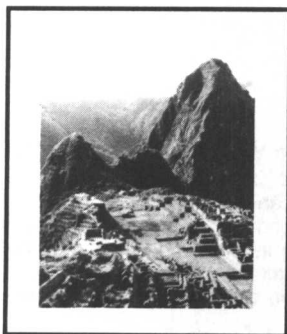
It is still largely unknown how Sumerian **writing and urban living** spread, but archaeological discoveries in Turkey indicate that they spread beyond the lower valley of the Tigris and Euphrates Rivers. Clay tablets containing lists of livestock and towns document a robust economy at 2400 B.C.E.—just before the rise of Sargon and the **Akkadian Empire**.

13. **Collapse of Earliest Known Empire Is Linked to Long, Harsh Drought**, John Noble Wilford, *New York Times*, August 24, 1993. 62

After only a century of success, the **world's first empire** collapsed under the pressure of severe drought—a **climatic change** that resulted in abandoned cities and land. Leadership in the region thus passed from Akkad to Ur to Babylon as the **Akkadian Empire** came to an end in 2200 B.C.E.

14. **Out of Africa: The Superb Artwork of Ancient Nubia**, David Roberts, *Smithsonian*, June 1993. 65

Due to prejudice, undeciphered writing, lack of archaeological exploration, inhospitable climate, and information that comes mainly from enemies, the **Nubian civilization** is largely unknown except through recent displays of art. It was once thought to be an offshoot of Egyptian culture, but this black civilization flourished at the same time as Egypt's and once conquered all of **Egypt** around 730 B.C.E.

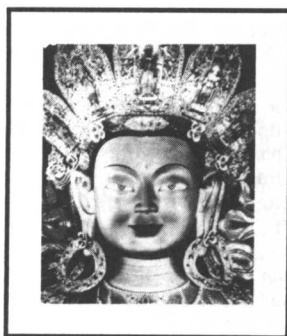


Unit 4

The Later Civilizations to 500 C.E.

Seven articles discuss some of the dynamics of culture in Peru, Greece, and Rome.

15. **Marriage and Motherhood in Ancient Egypt**, Joyce Tyldesley, *History Today*, April 1994. 71
In *ancient Egypt marriage and divorce* were of little concern to the government. A close *family* and many children were signs of female fertility and male virility. A husband assumed the role of protector, and a wife could administer her own property and could expect to inherit one third of her husband's property at his death.
16. **Tales from the Crypt**, *U.S. News & World Report*, May 29, 1995. 77
Egypt's Valley of the Kings, where King Tutankhamen's treasure and tomb were found, revealed another secret under a parking area. Egyptologist Kent Weeks discovered a vast underground *tomb site* meant for the 50 sons of Ramses II. Although looted of treasure, the rubble and wall inscriptions make the location a major find.
17. **New Finds Suggest Even Earlier Trade on Fabled Silk Road**, John Noble Wilford, *New York Times*, March 16, 1993. 81
Strands of silk have been found in the hair of an Egyptian mummy of 1000 B.C.E., long before the supposed establishment of the silk trade with China in 200 B.C.E. This suggests a far earlier time for the establishment of East-West *trade* along the famous *silk road*.
18. **Herodotus—Roving Reporter of the Ancient World**, Carmine Ampolo, *The UNESCO Courier*, March 1990. 84
To Herodotus, history involved the gathering of information, the writing of the story, and a search for truth. He provided different versions of events, copious details, and set the course of *historiography* in the West.
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19. **Tales from a Peruvian Crypt**, Walter Alva and Christopher B. Donnan, *Natural History*, May 1994. 88
Rising from the agricultural area of coastal *Peru*, the prehistoric *Moche culture* built the largest structure in South America and created art objects of copper, gold, and silver. In the first three centuries C.E., they developed a stratified society and blood sacrifices, but no writing. The culture collapsed suddenly, probably due to *climate* or national disaster.
20. **In Classical Athens, a Market Trading in the Currency of Ideas**, John Fleischman, *Smithsonian*, July 1993. 92
The Agora was the heart of *urban life* for *Greek* city-states. In this public plaza, people met to trade, gossip, argue, and vote. An open space surrounded by civic buildings and religious sites, the *Agora of Athens* was the place where Socrates taught and died.
21. **Women and Politics in Democratic Athens**, Susan Cole, *History Today*, March 1994. 97
In *Greek life* men dominated political and military affairs. *Women* lived, for the most part, in the private domestic world of the home. Susan Cole discusses how women obtained public recognition mainly through the representation of the female divinity Athena.



Unit 5

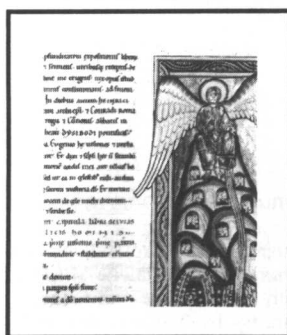
The Great Religions

Ten articles discuss the beginnings of the world's great religions, including Judaism, Christianity, Islam, Hinduism, and Buddhism.

22. **Dido Was Its Old Flame, and Hannibal Called It Home**, 101
Robert Wernick, *Smithsonian*, April 1994.
After hundreds of years of struggling for control of *trade* in the Mediterranean Sea, *Rome and Carthage* emerged as rival superpowers. They fought three *Punic Wars* for domination of the world. Hannibal was the hero of the second, but the third war brought destruction to Carthage and the domination of Rome for the next 500 years.
23. **Ancient Roman Life**, John Woodford, *Michigan Today*, December 1985. 106
What were the facts of everyday life in *Roman society*? The evidence presented here provides information about life expectancy, child mortality, disease, and contraception.
24. **Murderous Games**, Keith Hopkins, *History Today*, June 1983. 108
Gladiatorial shows and public executions, by-products of war, helped to maintain a culture of violence in *Rome* during times of peace. They served also as a diversion for a restless populace for which brutality was commonplace.
25. **Old Sports**, Allen Guttman, *Natural History*, July 1992. 115
The ancient *Greeks* were not the only people to use *sports* as a political or religious statement. Pharaohs had to prove their physical fitness to rule, murals in *Egyptian* tombs depicted wrestling scenes, a *Minoan* fresco pictured two boxing boys, and *Etruscans* enjoyed chariot races.

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26. **Mysterious Mexican Culture Yields Its Secrets**, John Noble Wilford, *New York Times*, June 29, 1993. 120
The supreme deity at Teotihuacán in central *Mexico* was a goddess associated with military conquest, human sacrifice, and fertility. The multipurpose city, with its imposing Pyramid of the Sun and a population of 200,000, was one of the largest in the world in 600 C.E. The culture, however, collapsed for unknown reasons in 750 C.E.
27. **The Death Cults of Prehistoric Malta**, Caroline Malone, Anthony Bonanno, Tancred Gouder, Simon Stoddart, and David Trump, *Scientific American*, December 1993. 123
Environmental degradation seems to have inspired an obsession with religious cults, including that of the "fat ladies," on the island of *Malta* around 2500 B.C.E. Vast amounts of energy went into erecting temples, but by 2000 B.C.E. the culture had disappeared and this prehistoric religion might be considered a failure.
28. **Women in Greek Myth**, Mary R. Lefkowitz, *The American Scholar*, Spring 1985. 132
A major contribution of the Greeks to humankind was their mythology. Although *women* are passive and subordinate in the myths, they are not without a voice to comment upon their fate.
29. **Mysteries of the Bible**, *U.S. News & World Report*, April 17, 1995. 137
Archaeologists have had only partial success confirming events of the *Old and New Testaments*. There exists little proof, other than the biblical record, about the Hebrew exodus from Egypt and the conquest of Canaan. There is greater evidence to support the reigns of the Hebrew Kings, the Babylonian exile, the use of crucifixion, and the rule of Pontius Pilate.

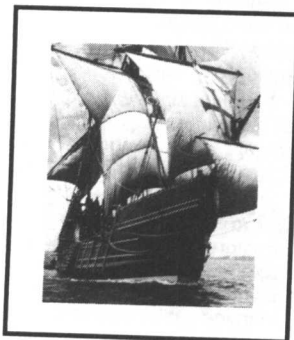


Unit 6

The World of the Middle Ages, 500–1500

Seven selections examine the development of world cultures during this period: in the West, feudalism and the growth of the nation-state; in the East, the golden age of peak development.

30. **Who Was Jesus?** *U.S. News & World Report*, December 20, 1993. 142
The quest for the **historical Jesus** continues. Some scholars doubt, for example, that Jesus ever proclaimed himself the Messiah or performed all the miracles ascribed to him. Walking on water and calming the seas are similar to Greek stories of powerful gods that may have been transferred to Jesus. It may be that Jesus will remain an obscure historical figure, but the power of his message to humankind remains.
31. **The Christmas Covenant**, *U.S. News & World Report*, December 19, 1994. 146
According to the Gospel of Matthew, Jesus said that no one would know when he would return. However, the approach of the year 2000 has inspired contemporary doomsday prophecies. Despite prior failures of prediction, the thought of a **second coming** and **apocalypse** remains strong in **Christian** belief.
32. **The World of Islam**, *Time*, April 16, 1979. 151
Muhammad established the religion of **Islam** in the seventh century A.D. Since then, Westerners have been disturbed by its close parallels to **Christianity**, as well as by the mythology of the "mysterious East."
33. **Charles Malamoud**, Tony Lévy, *The UNESCO Courier*, May 1993. 156
Charles Malamoud, a French specialist in the **religions of India**, compares Vedism and Hinduism in an interview with Tony Lévy. The Vedic period extends from 1500 to 500 B.C.E.; the Hindu period begins about 500 B.C.E. Other religions—Buddhism, Jainism, and Islam—have also influenced the subcontinent.
34. **The Koran, Gita, and Tripitaka**, Thomas B. Coburn, *Christian Science Monitor*, November 13, 1991. 161
The written word does not have the same significance and function in the **major religions**. "Bibles" of various religions differ in content, and simple cross-cultural comparisons cannot be made.
35. **Confucius**, Jonathan D. Spence, *The Wilson Quarterly*, Autumn 1993. 163
Despite attacks upon **Confucian ideas** in the twentieth century, there has been a resurgence of interest in the fifth century B.C.E. teacher during the past two decades. **Confucius** did not speak about life after death, but his compelling humanity and belief in the importance of culture and learning make him worthy of contemporary study.
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36. **Lilavati, Gracious Lady of Arithmetic**, Francis Zimmermann, *The UNESCO Courier*, November 1989. 172
Arab scholars in the eighth century transferred from India **mathematical concepts** of zero and a form of trigonometry. In the Sanskrit documents, the numbers were represented by literary phrases and metaphors and used for ritualistic and religious purposes.
37. **The Master-Chronologers of Islam**, Abdesselam Cheddadi, *The UNESCO Courier*, March 1990. 175
Islamic historical writing of this middle period was of enormous volume and diversity. It reached a high point with the work of Ibn Khaldun, who developed theories of society upon which to judge historical events.



Unit 7

1500: The Era of Discovery

Six articles examine the enormous global impact of the voyages of discovery.

38. **All the Khan's Horses**, Morris Rossabi, *Natural History*, 180
October 1994.

The horse, compound bow, stirrup, and saddle brought success to **Genghis Khan**. With a superb cavalry, this Mongol warrior in two decades laid the foundation of an empire that ruled much of **Asia** in the thirteenth and fourteenth centuries.

39. **Women and the Early Church**, Brent Shaw, *History Today*, 184
February 1994.

Female priests were not unusual in the **early Christian Church**, but their role in the spread of the new religion has received little attention. **Women** were gradually eliminated from church positions, but wealthy educated women, widows, and female martyrs resisted this exclusion.

40. **Hazards on the Way to the Middle Ages**, Barbara Tuchman, *The Atlantic Monthly*, December 1975. 189

Reconstructing the world of the **Middle Ages** was an intellectual exercise that was not easy for historian Barbara Tuchman. The **Christian** religion in all its manifestations was a major barrier that created persistent gaps between ideas and practice.

41. **The Making of Magna Carta**, Ruth I. Mills, *British Heritage*, 196
October/November 1990.

The Magna Carta, the famous statement of **personal liberties** for the barons of England in the thirteenth century, resulted from almost a century of struggle. It was revised and reconfirmed many times, and in 1297 it became a part of the Revised Statutes.

42. **Clocks: Revolution in Time**, David Landes, *History Today*, 200
January 1984.

The mechanical clock was the key machine of the Industrial Revolution. This **technology** from the **Middle Ages** differentiated Europe from the rest of the world.

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43. **The Emperor's Giraffe**, Samuel M. Wilson, *Natural History*, 210
December 1992.

While the Portuguese began their tentative explorations along the west coast of Africa in 1414, **Zheng He**, a Chinese Muslim, sailed westward to establish trade with **East Africa** and to assert **Chinese power** in the Indian Ocean. By 1433, due to economic problems and indifference, the Ming dynasty gave up exploration, which left the world to Europeans.

44. **Columbus and His Four Fateful Voyages**, David Gelman, 212
Newsweek, Special Issue, Fall/Winter 1991.

The **story of Christopher Columbus** is one of persistence and success. He was a poor foreigner with a poor sense of geography who nonetheless convinced the Spanish throne of the merits of his venture. It was a venture that changed the world.

45. The Sailors of Palos , Peter F. Copeland, <i>American History Illustrated</i> , March/April 1993.	216
Christopher Columbus is famous for his discovery of a New World, but what was the adventure like for the common sailors who went with him? The crewmen ranged in age, duties, and skills, and, contrary to legend, only one was a convicted murderer. These illiterate, cynical, superstitious, tough seamen endured life on the water, and it is remarkable that none died by accident or disease during the fateful voyage of 1492 .	
46. Reconsidering Columbus , Robert P. Hay, <i>USA Today Magazine</i> (<i>Society for the Advancement of Education</i>), November 1991.	226
The quincentenary of the voyages of Christopher Columbus brought bitter moral judgments down upon the original events and upon Columbus . Was it progress, genocide, or plunder? There is no returning, however, and the history of the past 500 years is the history of Europeanization of the world .	
47. After Dire Straits, an Agonizing Haul across the Pacific , Simon Winchester, <i>Smithsonian</i> , April 1991.	231
Following the wake of Christopher Columbus, other European explorers set forth. One of Magellan's ill-starred ships succeeded in the first circumnavigation of the earth.	
48. The Europe of Columbus and Bayazid , Charles Tilly, <i>Middle East Report</i> , September/October 1992.	237
At the time of Christopher Columbus, China dominated the East and Islam prevailed from Southeast Asia to North Africa. The Ottoman Turks had recently taken Constantinople and expanded into the Balkans. Europe was still peripheral until their explorations allowed Europeans to outflank their Muslim rivals.	
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WORLD HISTORY VOLUME I

Prehistory to 1500

Editor

David McComb
Colorado State University

David McComb received his Ph.D. from the University of Texas at Austin and is currently a professor of history at Colorado State University. Dr. McComb has written eight books, numerous articles and book reviews, and he teaches courses in the history of the United States, sports, and the world. He has traveled twice around the world as a Semester at Sea faculty member of the University of Pittsburgh, and he has spent additional time in India and Mexico.

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Topic Guide

This topic guide suggests how the selections in this book relate to topics of traditional concern to world history students and professionals. It is useful for locating articles that relate to each other for reading and research. The guide is arranged alphabetically according to topic. Articles may, of course, treat topics that do not appear in the topic guide. In turn, entries in the topic guide do not necessarily constitute a comprehensive listing of all the contents of each selection.

TOPIC AREA	TREATED IN	TOPIC AREA	TREATED IN
Africa	<ul style="list-style-type: none"> 7. Writing Right 14. Out of Africa 22. Dido Was Its Old Flame 43. Emperor's Giraffe 	Economics	<ul style="list-style-type: none"> 8. Origin of Numbers 9. Corn in the New World 12. Old Tablet from Turkish Site 13. Collapse of Earliest Known Empire 17. New Finds Suggest Even Earlier Trade on Fabled Silk Road
Agriculture	<ul style="list-style-type: none"> 4. Frost and Found 9. Corn in the New World 10. Eloquent Bones of Abu Hureyra 11. How Man Invented Cities 13. Collapse of Earliest Known Empire 	Egypt	<ul style="list-style-type: none"> 14. Out of Africa 15. Marriage and Motherhood in Ancient Egypt 16. Tales from the Crypt 17. New Finds Suggest Even Earlier Trade on Fabled Silk Road
Americas	<ul style="list-style-type: none"> 5. Ice-Age Mystery 9. Corn in the New World 19. Tales from a Peruvian Crypt 26. Mysterious Mexican Culture Yields Its Secrets 44. Columbus and His Four Fateful Voyages 46. Reconsidering Columbus 	Environment	<ul style="list-style-type: none"> 2. Evolution of Life on the Earth 3. Climate and the Rise of Man 4. Frost and Found 5. Ice-Age Mystery 9. Corn in the New World 11. How Man Invented Cities 13. Collapse of Earliest Known Empire 19. Tales from a Peruvian Crypt 46. Reconsidering Columbus
Ancient Civilizations	<ul style="list-style-type: none"> 7. Writing Right 8. Origin of Numbers 11. How Man Invented Cities 12. Old Tablet from Turkish Site 13. Collapse of Earliest Known Empire 14. Out of Africa 15. Marriage and Motherhood in Ancient Egypt 19. Tales from a Peruvian Crypt 21. Women and Politics in Democratic Athens 22. Dido Was Its Old Flame 23. Ancient Roman Life 24. Murderous Games 25. Old Sports 26. Mysterious Mexican Culture Yields Its Secrets 	Europe	<ul style="list-style-type: none"> 4. Frost and Found 6. Neptune's Ice Age Gallery 20. In Classical Athens 21. Women and Politics in Democratic Athens 23. Ancient Roman Life 28. Women in Greek Myth 39. Women and the Early Church 40. Hazards on the Way to the Middle Ages 41. Making of Magna Carta 42. Clocks 44. Columbus and His Four Fateful Voyages 45. Sailors of Palos 46. Reconsidering Columbus 47. After Dire Straits, an Agonizing Haul across the Pacific 48. Europe of Columbus and Bayazid
Asia	<ul style="list-style-type: none"> 5. Ice-Age Mystery 7. Writing Right 17. New Finds Suggest Even Earlier Trade on Fabled Silk Road 35. Confucius 38. All the Khan's Horses 43. Emperor's Giraffe 	Evolution	<ul style="list-style-type: none"> 1. Cosmic Calendar 2. Evolution of Life on the Earth 3. Climate and the Rise of Man
Buddhism	<ul style="list-style-type: none"> 33. Charles Malamoud 34. Koran, Gita, and Tripitaka 	Geography	<ul style="list-style-type: none"> 3. Climate and the Rise of Man 5. Ice-Age Mystery 6. Neptune's Ice Age Gallery 9. Corn in the New World 11. How Man Invented Cities 12. Old Tablet from Turkish Site 13. Collapse of Earliest Known Empire 43. Emperor's Giraffe 44. Columbus and His Four Fateful Voyages 47. After Dire Straits, an Agonizing Haul across the Pacific
Christianity	<ul style="list-style-type: none"> 29. Mysteries of the Bible 30. Who Was Jesus? 31. Christmas Covenant 32. World of Islam 39. Women and the Early Church 40. Hazards on the Way to the Middle Ages 		

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Greeks	18. Herodotus 20. In Classical Athens 21. Women and Politics in Democratic Athens 28. Women in Greek Myth	Religion	16. Tales from the Crypt 26. Mysterious Mexican Culture Yields Its Secrets 27. Death Cults of Prehistoric Malta 28. Women in Greek Myth 29. Mysteries of the Bible 30. Who Was Jesus? 31. Christmas Covenant 32. World of Islam 33. Charles Malamoud 34. Koran, Gita, and Tripitaka 35. Confucius 39. Women and the Early Church 40. Hazards on the Way to the Middle Ages
Hinduism	33. Charles Malamoud 34. Koran, Gita, and Tripitaka	Romans	22. Dido Was Its Old Flame 23. Ancient Roman Life 24. Murderous Games
Historiography	18. Herodotus 37. Master-Chronologers of Islam 40. Hazards on the Way to the Middle Ages	Sports	24. Murderous Games 25. Old Sports
India	8. Origin of Numbers 33. Charles Malamoud 36. Lilavati 43. Emperor's Giraffe	Technology	4. Frost and Found 7. Writing Right 8. Origin of Numbers 9. Corn in the New World 10. Eloquent Bones of Abu Hureyra 36. Lilavati 42. Clocks 45. Sailors of Palos
Islam	32. World of Islam 34. Koran, Gita, and Tripitaka	Trade	8. Origin of Numbers 12. Old Tablet from Turkish Site 17. New Finds Suggest Even Earlier Trade on Fabled Silk Road 43. Emperor's Giraffe 44. Columbus and His Four Fateful Voyages 48. Europe of Columbus and Bayazid
Judalsm	29. Mysteries of the Bible 30. Who Was Jesus?	Urbanization	7. Writing Right 8. Origin of Numbers 10. Eloquent Bones of Abu Hureyra 11. How Man Invented Cities 12. Old Tablet from Turkish Site 20. In Classical Athens 22. Dido Was Its Old Flame 23. Ancient Roman Life 24. Murderous Games 26. Mysterious Mexican Culture Yields Its Secrets
Middle Ages.	39. Women and the Early Church 40. Hazards on the Way to the Middle Ages 48. Europe of Columbus and Bayazid	Warfare	22. Dido Was Its Old Flame 24. Murderous Games 38. All the Khan's Horses 41. Making of Magna Carta
Middle East	7. Writing Right 10. Eloquent Bones of Abu Hureyra 12. Old Tablet from Turkish Site 13. Collapse of Earliest Known Empire 29. Mysteries of the Bible 30. Who Was Jesus? 32. World of Islam 36. Lilavati 37. Master-Chronologers of Islam 48. Europe of Columbus and Bayazid	Women	15. Marriage and Motherhood in Ancient Egypt 21. Women and Politics in Democratic Athens 23. Ancient Roman Life 27. Death Cults of Prehistoric Malta 39. Women and the Early Church
Politics	20. In Classical Athens 21. Women and Politics in Democratic Athens 41. Making of Magna Carta 48. Europe of Columbus and Bayazid		
Population	5. Ice-Age Mystery 11. How Man Invented Cities 12. Old Tablet from Turkish Site 46. Reconsidering Columbus		
Prehistoric Culture	4. Frost and Found 6. Neptune's Ice Age Gallery 9. Corn in the New World 10. Eloquent Bones of Abu Hureyra 11. How Man Invented Cities 19. Tales from a Peruvian Crypt 26. Mysterious Mexican Culture Yields Its Secrets 27. Death Cults of Prehistoric Malta		

Natural History: The Setting for Human History

The stage for human history has been planet Earth and the environment it provided for life. Human beings have been shaped by this environment and have used the resources of their surroundings for survival and comfort. It was not until recently, however, and then without planning, that humankind began to influence the environment on a global scale. Coincidentally, and perhaps fortunately, space exploration made us recognize the potential danger of disrupting the life-sustaining atmosphere that wraps our planet like the thin skin of an apple. Buckminster Fuller's concept of "spaceship Earth" captured both the wonder—how did we get here on this blue planet orbiting in black space?—and the warning—we have no other home, we had better take care of it.

Carl Sagan's book *The Dragons of Eden* (1979) imagined all time pressed into a calendar year. In such a circumstance the first humans appeared at 10:30 p.m. on December 31 and agriculture was invented at 40 seconds before midnight. In comparison to geologic time, human history amounts to less than a minute on the time scale of one year. That humbling fact is enlarged by Stephen Jay Gould, the most important naturalist currently writing for the public. Without fortuitous circumstances, human beings might not be here at all, according to Gould. If it had to be done over again, events are so unpredictable the chances are we would not make it a second time.

Among the important circumstances of human evolution are changes in climate, a fact that causes concern today with regard to the warming of the atmosphere. "Climate and the Rise of Man" reports that climatic changes have been instrumental at the major turning points in evolution and suggests that this will probably continue to be the case. We are still living in the interstice between ice ages, and our human civilizations have flourished in this brief period. Migrations have populated the planet from the New World to the tip of South Amer-

ica during this time. Evan Hadingham offers a further confirmation of the hypothesis of Asiatic movement across the Bering Strait. Dental patterns seem to prove the point. There is still debate, however, about the time of crossing. Although there is strong archaeological evidence to indicate a passage during the past ice age of 12,000 years ago, it could have been much earlier.

The most dramatic reminder of our recent ascent as a species came in 1991 when the body of a tattooed Bronze Age man emerged from the ice of a glacier in the Alps between Austria and Italy. The man who may have been a shepherd had been preserved frozen for 5,000 years. His clothing, weapons, and even some coarse grain had been preserved by the glacier that was now retreating as a result of global warming. Discoveries such as the Iceman, as he came to be called, demonstrate how closely humankind has been linked to the environment for survival. Current circumstances with neighborhood supermarkets and shopping malls tend to insulate us from this reality. This short unit on natural history serves as a reminder of our humble beginnings and our comparatively brief sojourn on spaceship Earth.

Looking Ahead: Challenge Questions

How did the universe, Earth, and life begin? Discuss other theories that should be considered.

What has been the influence of climate on human life? What might happen when the climate shifts again?

How did human beings get to the New World? What is the evidence for this? Did humans evolve in the New World? Why or why not?

What are the scientific tools that provide information about the distant past?

Of what use is the Iceman? Is it important for human beings to know how the species evolved? Why?



The Cosmic Calendar

How a Pulitzer Prize-winning scientist-author visualizes cosmic history—from the Big Bang creation of the universe up to present-day time on Earth. His “calendar” may stagger your imagination.

Carl Sagan

The world is very old, and human beings are very young. Significant events in our personal lives are measured in years or less; our lifetimes, in decades; our family genealogies, in centuries; and all of recorded history, in millennia. But we have been preceded by an awesome vista of time, extending for prodigious periods into the past, about which we know little—both because there are no written records and because we have real difficulty in grasping the immensity of the intervals involved.

Yet we are able to date events in the remote past. Geological stratification and radioactive dating provide information on archaeological, paleontological, and geological events; and astrophysical theory provides data on the ages of planetary surfaces, stars, and the Milky Way galaxy, as well as an estimate of the time that has elapsed since that extraordinary event called the Big Bang—an explosion that involved all of the matter and energy in the present universe. The Big Bang may be the beginning of the universe, or it may be a discontinuity in which information about the earlier history of the universe was destroyed. But it is certainly the earliest event about which we have any record.

The most instructive way I know to express this cosmic chronology is to imagine the 15-billion-year lifetime of the universe (or at least its present incarnation since the Big Bang) compressed into the span of a single year. Then every billion years of Earth history would correspond to about 24 days of our cosmic year, and 1 second of that year to 475 real revolutions of the Earth about the sun. I present the cosmic chronology in three forms: a list of some representative pre-December dates; a calendar for the month of December; and a closer look at the late evening of New Year's Eve. On

PRE-DECEMBER DATES

January 1	Big Bang
May 1	Origin of the Milky Way galaxy
September 9	Origin of the solar system
September 14	Formation of the Earth
September 25	Origin of life on Earth
October 2	Formation of the oldest rocks known on Earth
October 9	Date of oldest fossils (bacteria and blue-green algae)
November 1	Invention of sex (by microorganisms)
November 12	Oldest fossil photosynthetic plants
November 15	Eucaryotes (first cells with nuclei) flourish

this scale, the events of our history books—even books that make significant efforts to deprovincialize the present—are so compressed that it is necessary to give a second-by-second recounting of the last seconds of the cosmic year. Even then, we find events listed as contemporary that we have been taught to consider as widely separated in time. In the history of life, an equally rich tapestry must have been woven in other periods—for example, between 10:02 and 10:03 on the morning of April 6th or September 16th. But we have detailed records only for the very end of the cosmic year.