

**Bulliet  
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The  
**Earth**  
and Its  
**Peoples**

A Global History

Seventh Edition





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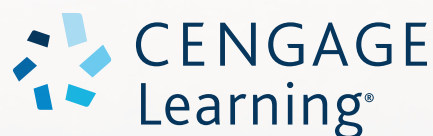
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# The Earth and Its Peoples

A Global History **Seventh Edition**

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**ABBREVIATIONS**

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



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# Brief Contents



## **PART I The Emergence of Human Communities, to 500 BCE 2**

- 1** Nature, Humanity, and History, to 3500 BCE **4**
- 2** The First River-Valley Civilizations, 3500–1500 BCE **26**
- 3** The Mediterranean and Middle East, 2000–500 BCE **50**
- 4** New Civilizations Outside the West Asian Core Area, 2300 BCE–350 CE **80**

## **PART II The Formation of New Cultural Communities, 1000 BCE–400 CE 110**

- 5** Greece and Iran, 1000–30 BCE **112**
- 6** An Age of Empires: Rome and Han China, 753 BCE–330 CE **142**
- 7** India and Southeast Asia, 1500 BCE–1025 CE **168**
- 8** Peoples and Civilizations of the Americas, from 1200 BCE **192**

## **PART III Growth and Interaction of Cultural Communities, 300 BCE–1200 CE 222**

- 9** Networks of Communication and Exchange, 300 BCE–1100 CE **224**
- 10** The Sasanid Empire and the Rise of Islam, 200–1200 **244**
- 11** Christian Societies Emerge in Europe, 600–1200 **268**
- 12** Central and East Asia, 400–1200 **292**

## **PART IV Interregional Patterns of Culture and Contact, 1200–1550 316**

- 13** Mongol Eurasia and Its Aftermath, 1200–1500 **318**
- 14** Latin Europe, 1200–1500 **344**
- 15** Southern Empires, Southern Seas, 1200–1500 **366**
- 16** The Maritime Revolution, to 1550 **392**

## **PART V The Globe Encompassed, 1500–1750 422**

- 17** Transformations in Europe, 1500–1750 **424**
- 18** The Diversity of American Colonial Societies, 1530–1770 **452**
- 19** The Atlantic System and Africa, 1550–1800 **478**
- 20** Between Europe and China, 1500–1750 **506**
- 21** East Asia in Global Perspective **532**

## **PART VI Revolutions Reshape the World, 1750–1870 554**

- 22** The Early Industrial Revolution, 1760–1851 **556**
- 23** Revolutionary Changes in the Atlantic World, 1750–1850 **584**
- 24** Land Empires in the Age of Imperialism, 1800–1870 **610**
- 25** Nation Building and Economic Transformation in the Americas, 1800–1890 **634**

## **PART VII Global Diversity and Dominance, 1750–1945 666**

- 26** Varieties of Imperialism in Africa, India, Southeast Asia, and Latin America, 1750–1914 **668**
- 27** The New Power Balance, 1850–1900 **696**
- 28** The Crisis of the Imperial Order, 1900–1929 **726**
- 29** The Collapse of the Old Order, 1929–1949 **750**
- 30** Revolutions in Living, 1900–1950 **776**

## **PART VIII Perils and Promises of a Global Community, 1945 to the Present 806**

- 31** The Cold War and Decolonization, 1945–1975 **808**
- 32** The End of the Cold War and the Challenge of Economic Development and Immigration, 1975–2000 **834**
- 33** Leaving the Twentieth Century **864**



# Contents

MAPS **xix**

ENVIRONMENT & TECHNOLOGY **xxi**

DIVERSITY & DOMINANCE **xxi**

MATERIAL CULTURE **xxii**

ISSUES IN WORLD HISTORY **xxii**

PREFACE **xxiii**

ABOUT THE AUTHORS **xxix**

NOTE ON SPELLING AND USAGE **xxxii**

## **PART I The Emergence of Human Communities, to 500 BCE**

**2**

### **1 Nature, Humanity, and History, to 3500 BCE 4**

#### **1-1 African Genesis 5**

1-1a Interpreting the Evidence **5** • 1-1b Human Evolution **6** • 1-1c Migrations from Africa **8**

#### **1-2 Technology and Culture in the Ice Age 11**

1-2a Food Gathering and Stone Tools **11** • 1-2b Gender Roles and Social Life **14** • 1-2c Hearths and Cultural Expressions **15**

#### **1-3 The Agricultural Revolutions 16**

1-3a The Transition to Plant Cultivation **16** • 1-3b Domesticated Animals and Pastoralism **19** • 1-3c Agriculture and Ecological Crisis **20**

#### **1-4 Life in Neolithic Communities 21**

1-4a The Triumph of Food Producers **21** • 1-4b Cultural Expressions **21** • 1-4c Early Towns and Specialists **22**

#### **1-5 Conclusion 24**

Key Terms **25** • Review Questions **25**

**DIVERSITY & DOMINANCE:** Cave Art **12**

**ENVIRONMENT & TECHNOLOGY:** The Iceman **16**

### **2 The First River-Valley Civilizations, 3500–1500 BCE 26**

#### **2-1 Mesopotamia 27**

2-1a Settled Agriculture in an Unstable Landscape **29** • 2-1b Sumerians and Semites **29** • 2-1c Cities, Kings, and Trade **30** • 2-1d Mesopotamian Society **33** • 2-1e Gods, Priests, and Temples **34** • 2-1f Technology and Science **36**

#### **2-2 Egypt 38**

2-2a The Land of Egypt: “Gift of the Nile” **39** • 2-2b Divine Kingship **40** • 2-2c Administration

and Communication **41** • 2-2d The People of Egypt **42** • 2-2e Belief and Knowledge **43**

#### **2-3 The Indus Valley Civilization 45**

2-3a Natural Environment **45** • 2-3b Material Culture **46** • 2-3c Transformation of the Indus Valley Civilization **48**

#### **2-4 Conclusion 48**

Key Terms **49** • Review Questions **49**

**DIVERSITY & DOMINANCE:** Violence and Order in the Babylonian New Year’s Festival **36**

**ENVIRONMENT & TECHNOLOGY:** Environmental Stress in the Indus Valley **47**

### **3 The Mediterranean and Middle East, 2000–500 BCE 50**

#### **3-1 The Cosmopolitan Middle East, 1700–1100 BCE 51**

3-1a Western Asia **52** • 3-1b New Kingdom Egypt **54** • 3-1c Commerce and Communication **56**

#### **3-2 The Aegean World, 2000–1100 BCE 57**

3-2a Minoan Crete **57** • 3-2b Mycenaean Greece **58** • 3-2c The Fall of Late Bronze Age Civilizations **60**

#### **3-3 The Assyrian Empire, 911–612 BCE 61**

3-3a God and King **62** • 3-3b Conquest and Control **62** • 3-3c Assyrian Society and Culture **63**

#### **3-4 Israel, 2000–500 BCE 64**

3-4a Origins, Exodus, and Settlement **64** • 3-4b Rise of the Monarchy **66** • 3-4c Fragmentation and Dispersal **68**

#### **3-5 Phoenicia and the Mediterranean, 1200–500 BCE 69**

3-5a The Phoenician City-States **69** • 3-5b Expansion into the Mediterranean **72** • 3-5c Carthage’s Commercial Empire **72** • 3-5d War and Religion **76**





### 3-6 Failure and Transformation, 750–550 BCE 77

### 3-7 Conclusion 78

Key Terms 79 • Review Questions 79

**DIVERSITY & DOMINANCE:** Protests Against the Ruling Class in Israel and Babylonia 70

**ENVIRONMENT & TECHNOLOGY:** The West African Voyage of Hanno the Carthaginian 74

## 4 New Civilizations Outside the West Asian Core Area, 2300 BCE–350 CE 80

### 4-1 Early China, 2000–221 BCE 81

4-1a Geography and Resources 82 • 4-1b The Late Neolithic: Artifacts and Legends 82 • 4-1c The Shang Period, 1766–1045 BCE 83 • 4-1d The Zhou Period, 1045–221 BCE 85 • 4-1e Confucianism, Daoism, and Chinese Society 88 • 4-1f The Warring States Period, 481–221 BCE 92

### 4-2 Nubia, 2300 BCE–350 CE 93

4-2a Early Cultures and Egyptian Domination, 2300–1100 BCE 93 • 4-2b The Kingdom of Meroë, 800 BCE–350 CE 95

### 4-3 Pastoral Nomads of the Eurasian Steppes, 1000–100 BCE 96

4-3a Early Nomadism 96 • 4-3b Steppe Nomads 97 • 4-3c The Scythians 98 • 4-3d China and the Nomads 99

### 4-4 Celtic Europe, 1000–50 BCE 100

4-4a The Spread of the Celts 100 • 4-4b Celtic Society 102 • 4-4c Belief and Knowledge 103

### 4-5 Conclusion 103

Key Terms 105 • Review Questions 105

**ENVIRONMENT & TECHNOLOGY:** Divination in Ancient Societies 86

**DIVERSITY & DOMINANCE:** Human Nature and Good Government in the *Analects* of Confucius and the Legalist Writings of Han Fei 90

**MATERIAL CULTURE:** Wine and Beer in the Ancient World 106

**ISSUES IN WORLD HISTORY:** Animal Domestication 108

## PART II The Formation of New Cultural Communities, 1000 BCE–400 CE

110

## 5 Greece and Iran, 1000–30 BCE 112

### 5-1 Ancient Iran, 1000–500 BCE 113

5-1a Geography and Resources 113 • 5-1b The Rise of the Persian Empire 115 • 5-1c Imperial Organization 117 • 5-1d Ideology and Religion 118

### 5-2 The Rise of the Greeks, 1000–500 BCE 120

5-2a Geography and Resources 120 • 5-2b The Emergence of the Polis 121 • 5-2c New Intellectual Currents 125 • 5-2d Athens and Sparta 128

### 5-3 The Struggle of Persia and Greece, 546–323 BCE 130

5-3a Early Encounters 130 • 5-3b The Height of Athenian Power 131 • 5-3c Inequality in Classical Greece 132 • 5-3d Failure of the City-State and Triumph of the Macedonians 134

### 5-4 The Hellenistic Synthesis, 323–30 BCE 135

### 5-5 Conclusion 139

Key Terms 141 • Review Questions 141

**DIVERSITY & DOMINANCE:** Poetry and Society in Early China and Greece 126

**ENVIRONMENT & TECHNOLOGY:** Ancient Astronomy 138

## 6 An Age of Empires: Rome and Han China, 753 BCE–330 CE 142

### 6-1 Rome's Creation of a Mediterranean Empire, 753 BCE–330 CE 143

6-1a A Republic of Farmers, 753–31 BCE 144 • 6-1b Expansion in Italy and the Mediterranean 147 • 6-1c The Failure of the Republic 148 • 6-1d The Roman Principate, 31 BCE–330 CE 149 • 6-1e An Urban Empire 149 • 6-1f The Rise of Christianity 153 • 6-1g Technology and Transformation 155

### 6-2 The Origins of Imperial China, 221 BCE–220 CE 157

6-2a The Qin Unification of China, 221–206 BCE 158 • 6-2b The Long Reign of the Han, 202 BCE–220 CE 160 • 6-2c Chinese Society 162 • 6-2d New Forms of Thought and Belief 163 • 6-2e Decline of the Han 164

## 6-3 Conclusion 165

Key Terms 167 • Review Questions 167

**DIVERSITY & DOMINANCE:** Socioeconomic Mobility: Winners and Losers in Imperial Rome and Han China 150

**ENVIRONMENT & TECHNOLOGY:** Ancient Glass 154

## 7 India and Southeast Asia, 1500 BCE–1025 CE 168

### 7-1 Foundations of Indian Civilization, 1500 BCE–300 CE 170

7-1a The Indian Subcontinent 170 • 7-1b The Vedic Age 171 • 7-1c Challenges to the Old Order: Jainism and Buddhism 173 • 7-1d The Evolution of Hinduism 175

### 7-2 Imperial Expansion and Collapse, 324 BCE–650 CE 178

7-2a The Mauryan Empire, 324–184 BCE 178 • 7-2b Commerce and Culture in an Era of Political Fragmentation 179 • 7-2c The Gupta Empire, 320–550 CE 180

### 7-3 Southeast Asia, 50–1025 CE 186

7-3a Early Civilization 186 • 7-3b The Srivijayan Kingdom 188

### 7-4 Conclusion 190

Key Terms 191 • Review Questions 191

**ENVIRONMENT & TECHNOLOGY:** Indian Mathematics 182

**DIVERSITY & DOMINANCE:** Relations Between Women and Men in the *Kama Sutra* and the *Arthashastra* 184

## 8 Peoples and Civilizations of the Americas, from 1200 BCE 192

### 8-1 Formative Civilizations of the Olmec and Chavín, 1200–200 BCE 194

8-1a The Mesoamerican Olmec, 1200–400 BCE 194 • 8-1b Early South American Civilization: Chavín, 900–200 BCE 197

### 8-2 Classic-Era Culture and Society in Mesoamerica, 200–900 199

8-2a Teotihuacan 199 • 8-2b The Maya 201

### 8-3 The Postclassic Period in Mesoamerica, 900–1300 205

8-3a The Toltecs 205 • 8-3b Cholula 207

### 8-4 Northern Peoples 207

8-4a Southwestern Desert Cultures 208 • 8-4b Mound Builders: The Hopewell and Mississippian Cultures 210

### 8-5 Andean Civilizations, 200–1400 211

8-5a Cultural Response to Environmental Challenge 211 • 8-5b The Early Intermediate Period Moche 212 • 8-5c Tiwanaku and Wari 215 • 8-5d Chimú 216

### 8-6 Conclusion 217

Key Terms 218 • Review Questions 218

**ENVIRONMENT & TECHNOLOGY:** The Maya Writing System 203

**DIVERSITY & DOMINANCE:** Burials as Historical Texts 214

**MATERIAL CULTURE:** Bells, Gongs, and Drums 219

**ISSUES IN WORLD HISTORY:** Oral Societies and the Consequences of Literacy 220

## PART III Growth and Interaction of Cultural Communities, 300 BCE–1200 CE

222

## 9 Networks of Communication and Exchange, 300 BCE–1100 CE 224

### 9-1 The Silk Road 226

9-1a Iranians and Chinese 226 • 9-1b Silk and New Crops 227 • 9-1c Nomadism in Central and Inner Asia 229 • 9-1d The Impact of the Silk Road 229 • 9-1e Warriors and Missionaries 230

### 9-2 The Indian Ocean Maritime System 230

9-2a Sailors' Tales 230 • 9-2b Ship Design 231 • 9-2c Origins of Contact and Trade 231 • 9-2d Indonesians in Madagascar 231 • 9-2e The Impact of Indian Ocean

Trade 231 • 9-2f Incense, Ivory, and Pottery 232 • 9-2g Western Ports 233 • 9-2h Eastern Ports 234

### 9-3 Routes Across the Sahara 234

9-3a Early Saharan Cultures 234 • 9-3b Rock Paintings 234 • 9-3c The Coming of the Camel 236 • 9-3d Trade Across the Sahara 236

### 9-4 Sub-Saharan Africa 237

9-4a A Challenging Geography 237 • 9-4b The Development of Cultural Unity 237 • 9-4c Economies and Social Practices 238 • 9-4d An Isolated World 238 • 9-4e African Cultural Characteristics 238 • 9-4f Migration from an Expanding Desert 238 • 9-4g The Advent



of Iron and the Bantu Migrations **239** • 9-4h Early Metalworking **239** • 9-4i Linguistic Relations **240**

### 9-5 The Spread of Ideas **240**

9-5a Ideas and Material Evidence **240** • 9-5b Domestic Pigs **240** • 9-5c The Spread of Buddhism **241** • 9-5d Two Kings: Ashoka and Kanishka **241** • 9-5e The Spread of Christianity **242**

### 9-6 Conclusion **243**

Key Terms **243** • Review Questions **243**

**ENVIRONMENT & TECHNOLOGY:** Nomad Homes **228**

**DIVERSITY & DOMINANCE:** Travel Accounts of Africa and India **232**

## 10 The Sasanid Empire and the Rise of Islam, 200–1200 **244**

### 10-1 The Sasanid Empire, 224–651 **246**

10-1a Politics and Society **246** • 10-1b Religion and Empire **247**

### 10-2 The Origins of Islam **248**

10-2a The Arabian Peninsula Before Muhammad **248** • 10-2b Muhammad in Mecca and Medina **249** • 10-2c Formation of the Umma **250** • 10-2d Succession to Muhammad **251**

### 10-3 The Rise and Fall of the Caliphate, 632–1258 **252**

10-3a The Islamic Conquests, 634–711 **252** • 10-3b The Umayyad and Early Abbasid Caliphates, 661–850 **253** • 10-3c Political Fragmentation, 850–1050 **254** • 10-3d Assault from Within and Without, 1050–1258 **257**

### 10-4 Islamic Civilization **259**

10-4a Law and Dogma **259** • 10-4b Converts and Cities **260** • 10-4c Women and Islam **262** • 10-4d Marginal Communities **264** • 10-4e The Recentring of Islam **264**

### 10-5 Conclusion **266**

Key Terms **267** • Review Questions **267**

**DIVERSITY & DOMINANCE:** Becoming Muslim **262**

**ENVIRONMENT & TECHNOLOGY:** Chemistry **265**

## 11 Christian Societies Emerge in Europe, 600–1200 **268**

### 11-1 The Byzantine Empire, 600–1200 **270**

11-1a An Empire Beleaguered **270** • 11-1b Society and Urban Life **270** • 11-1c Cultural Achievements **273**

### 11-2 Early Medieval Europe, 600–1000 **273**

11-2a The Time of Insecurity **273** • 11-2b A Self-Sufficient Economy **275** • 11-2c Early Medieval Society in the West **276**

### 11-3 The Western Church **278**

11-3a Politics and the Church **279** •

11-3b Monasticism **282**

### 11-4 Kievan Russia, 900–1200 **283**

11-4a The Rise of the Kievan Empire **283** • 11-4b Society and Culture **285**

### 11-5 Western Europe Revives, 1000–1200 **286**

11-5a The Role of Technology **286** • 11-5b Cities and the Rebirth of the Trade **287**

### 11-6 The Crusades, 1095–1204 **288**

11-6a The Roots of the Crusades **288** • 11-6b The Impact of the Crusades **289**

### 11-7 Conclusion **290**

Key Terms **291** • Review Questions **291**

**ENVIRONMENT & TECHNOLOGY:** Iron Production **278**

**DIVERSITY & DOMINANCE:** The Struggle for Christian Morality **280**

## 12 Central and East Asia, 400–1200 **292**

### 12-1 The Sui and Tang Empires, 581–755 **294**

12-1a Chang'an: Metropolis at the Center of East Asia **295** •

12-1b Buddhism and the Tang Empire **296** •

12-1c Upheavals and Repression, 750–879 **297** •

12-1d The End of the Tang Empire, 879–907 **300**

### 12-2 China and Its Rivals **300**

12-2a The Liao and Jin Challenge **301** • 12-2b Song Industries **302** • 12-2c Economy and Society in Song China **303**

### 12-3 New Kingdoms in East Asia **307**

12-3a Chinese Influences **307** • 12-3b Korea **308** •

12-3c Japan **308** • 12-3d Vietnam **310**

### 12-4 Conclusion **311**

Key Terms **312** • Review Questions **312**

**DIVERSITY & DOMINANCE:** Law and Society in China and Japan **298**

**ENVIRONMENT & TECHNOLOGY:** East Asian Transportation **305**

**MATERIAL CULTURE:** Salt **313**

**ISSUES IN WORLD HISTORY:** Religious Conversion **314**

**PART IV Interregional Patterns of Culture and Contact, 1200–1550**

316

**13 Mongol Eurasia and Its Aftermath, 1200–1500** 318**13-1 The Rise of the Mongols, 1200–1260** 319

13-1a Nomadism in Central Asia 320 • 13-1b The Mongol Conquests, 1215–1283 320 • 13-1c Overland Trade and Disease 322

**13-2 The Mongols and Islam, 1260–1500** 326

13-2a Mongol Rivalry 326 • 13-2b Islam and the State 327 • 13-2c Culture and Science in Islamic Eurasia 327

**13-3 Regional Responses in Western Eurasia** 330

13-3a Russia and Rule from Afar 330 • 13-3b New States in Eastern Europe and Anatolia 331

**13-4 Mongol Domination in China, 1271–1368** 332

13-4a The Yuan Empire, 1271–1368 332 • 13-4b The Fall of the Yuan Empire 334

**13-5 The Early Ming Empire, 1368–1500** 335

13-5a Ming China on a Mongol Foundation 335 • 13-5b Technology and Population 336 • 13-5c The Ming Achievement 337

**13-6 Centralization and Militarism in East Asia, 1200–1500** 339

13-6a Korea from the Mongols to the Choson Dynasty, 1231–1500 339 • 13-6b Political Transformation in Japan, 1274–1500 340 • 13-6c The Emergence of Vietnam, 1200–1500 342

**13-7 Conclusion** 343

Key Terms 343 • Review Questions 343

**DIVERSITY & DOMINANCE:** The Secret History of the Mongols 324

**ENVIRONMENT & TECHNOLOGY:** From Gunpowder to Guns 338

**14 Latin Europe, 1200–1500** 344**14-1 Rural Growth and Crisis** 345

14-1a Peasants, Population, and Plague 345 • 14-1b Social Rebellion 347 • 14-1c Mills and Mines 348

**14-2 Urban Revival** 349

14-2a Trading Cities 350 • 14-2b Civic Life 351 • 14-2c Gothic Cathedrals 354

**14-3 Learning, Literature, and the Renaissance** 355

14-3a The Renaissance 356 • 14-3b Humanists and Printers 357 • 14-3c Renaissance Artists 359

**14-4 Political and Military Transformations** 359

14-4a Monarchs, Nobles, and the Church 361 • 14-4b The Hundred Years' War 362 • 14-4c New Monarchies in France and England 362 • 14-4d Iberian Unification 363 • 14-4e The Ottoman Frontier 364 • 14-4f Christian Responses 364

**14-5 Conclusion** 364

Key Terms 365 • Review Questions 365

**DIVERSITY & DOMINANCE:** Persecution and Protection of Jews, 1272–1349 352

**ENVIRONMENT & TECHNOLOGY:** Stained-Glass Windows 355

**15 Southern Empires, Southern Seas, 1200–1500** 366**15-1 Tropical Africa and Asia** 367

15-1a Tropical Environments 367 • 15-1b Human Ecosystems 368 • 15-1c Water Systems and Irrigation 370 • 15-1d Mineral Resources 371

**15-2 New Islamic Empires** 372

15-2a Mali in the Western Sudan 372 • 15-2b The Delhi Sultanate in India 374

**15-3 Indian Ocean Trade** 378

15-3a Monsoon Mariners 378 • 15-3b Africa: The Swahili Coast and Zimbabwe 380 • 15-3c Arabia: Aden and the Red Sea 381 • 15-3d India: Gujarat and the Malabar Coast 381 • 15-3e Southeast Asia 382

**15-4 Social and Cultural Change** 383

15-4a Architecture, Learning, and Religion 383 • 15-4b Social and Gender Distinctions 384

**15-5 The Western Hemisphere** 385

15-5a Mesoamerica: The Aztecs 386 • 15-5b The Andes: The Inka 388

**15-6 Conclusion** 390

Key Terms 391 • Review Questions 391

**DIVERSITY & DOMINANCE:** Justice and Kingship 376

**ENVIRONMENT & TECHNOLOGY:** The Indian Ocean Dhow 380

**16 The Maritime Revolution, to 1550** 392**16-1 Global Maritime Expansion Before 1450** 394

16-1a The Indian Ocean 394 • 16-1b The Pacific Ocean 397 • 16-1c The Atlantic Ocean 399



**16-2 European Expansion, 1400–1550 400**

16-2a Motives for Exploration **401** • 16-2b Portuguese Voyages **401** • 16-2c Spanish Voyages **403**

**16-3 Encounters with Europe, 1450–1550 406**

16-3a Western Africa **406** • 16-3b Eastern Africa **408** • 16-3c Indian Ocean States **408** • 16-3d The Americas **412**

**16-4 Conclusion 416**

Key Terms **417** • Review Questions **417**

**ENVIRONMENT & TECHNOLOGY:** Vasco da Gama's Fleet **405**

**DIVERSITY & DOMINANCE:** Understanding Cross-Cultural Encounters **410**

**MATERIAL CULTURE:** Head Coverings **418**

**ISSUES IN WORLD HISTORY:** Climate and Population to 1500 **420**

**PART V The Globe Encompassed, 1500–1750****422****17 Transformations in Europe, 1500–1750 424****17-1 Culture and Ideas 426**

17-1a Early Reformation **426** • 17-1b The Counter-Reformation and the Politics of Religion **428** • 17-1c Local Religion, Traditional Culture, and Witch-Hunts **430** • 17-1d The Scientific Revolution **432** • 17-1e The Early Enlightenment **434**

**17-2 Social and Economic Life 434**

17-2a The Bourgeoisie **435** • 17-2b Peasants and Laborers **437** • 17-2c Women and the Family **439**

**17-3 Political Innovations 439**

17-3a State Development **440** • 17-3b The Monarchies of England and France **443** • 17-3c Warfare and Diplomacy **445** • 17-3d Paying the Piper **447**

**17-4 Conclusion 450**

Key Terms **451** • Review Questions **451**

**ENVIRONMENT & TECHNOLOGY:** Mapping the World **438**

**DIVERSITY & DOMINANCE:** Commercial Expansion and Risk **440**

**18 The Diversity of American Colonial Societies, 1530–1770 452****18-1 The Columbian Exchange 454**

18-1a Demographic Changes **454** • 18-1b Transfer of Plants and Animals **454**

**18-2 Spanish America and Brazil 456**

18-2a State and Church **457** • 18-2b Colonial Economies **460** • 18-2c Society in Colonial Latin America **463**

**18-3 English and French Colonies in North America 467**

18-3a Early English Experiments **467** • 18-3b The South **467** • 18-3c New England **469** • 18-3d The Middle Atlantic Region **470** • 18-3e French America **472**

**18.4 Colonial Expansion and Conflict 474**

18-4a Imperial Reform in Spanish America and Brazil **475** • 18-4b Reform and Reorganization in British America **475**

**18-5 Conclusion 477**

Key Terms **477** • Review Questions **477**

**ENVIRONMENT & TECHNOLOGY:** A Silver Refinery at Potosí, 1700 **461**

**DIVERSITY & DOMINANCE:** Race and Ethnicity in the Spanish Colonies: Negotiating Hierarchy **464**

**19 The Atlantic System and Africa, 1550–1800 478****19-1 Plantations in the West Indies 479**

19-1a Colonization Before 1650 **480** • 19-1b Sugar and Slaves **481**

**19-2 Plantation Life in the Eighteenth Century 482**

19-2a Technology and Environment **482** • 19-2b Slaves' Lives **485** • 19-2c Free Whites and Free Blacks **488**

**19-3 Creating the Atlantic Economy 490**

19-3a Capitalism and Mercantilism **490** • 19-3b The Atlantic Circuit **491**

**19-4 Africa, the Atlantic, and Islam 495**

19-4a The Gold Coast and the Slave Coast **495** • 19-4b The Bight of Biafra and Angola **497** • 19-4c Africa's European and Islamic Contacts **498**

**19-5 Conclusion 504**

Key Terms **505** • Review Questions **505**

**ENVIRONMENT & TECHNOLOGY:** Natural Disasters and the Caribbean Plantation Economy **484**

**DIVERSITY & DOMINANCE:** Slavery in West Africa and the Americas **502**

## 20 Between Europe and China, 1500–1750 506

### 20-1 The Ottoman Empire, to 1750 508

20-1a Expansion and Frontiers 508 • 20-1b Central Institutions 508 • 20-1c Crisis of the Military State, 1585–1650 511 • 20-1d Economic Change and Growing Weakness 511

### 20-2 The Safavid Empire, 1502–1722 515

20-2a Safavid Society and Religion 515 • 20-2b A Tale of Two Cities: Isfahan and Istanbul 516 • 20-2c Economic Crisis and Political Collapse 518

### 20-3 The Mughal Empire, 1526–1739 519

20-3a Political Foundations 519 • 20-3b Hindus and Muslims 521 • 20-3c Central Decay and Regional Challenges 522

### 20-4 The Russian Empire, 1500–1725 522

20-4a The Drive Across Northern Asia 523 • 20-4b Russian Society and Politics to 1725 523 • 20-4c Peter the Great 525

### 20-5 The Maritime Worlds of Islam, 1500–1750 527

20-5a Muslims in Southeast Asia 527 • 20-5b Muslims in Coastal Africa 528 • 20-5c European Powers in Southern Seas 529

### 20-6 Conclusion 530

Key Terms 531 • Review Questions 531

**DIVERSITY & DOMINANCE:** Islamic Law and Ottoman Rule 512

**ENVIRONMENT & TECHNOLOGY:** Persian Rugs 520

## 21 East Asia in Global Perspective 532

### 21-1 East Asia and Europe 533

21-1a Trading Companies and Missionaries 534 • 21-1b Chinese Influences on Europe 535 • 21-1c Japan and the Europeans 536

### 21-2 The Imjin War and Japanese Unification 537

### 21-3 Tokugawa Japan and Choson Korea to 1800 539

21-3a Japanese Reunification and Economic Growth 539 • 21-3b Japanese Elite Decline and Social Crisis 539 • 21-3c Choson Korea 541

### 21-4 From Ming to Qing 542

21-4a Ming Economic Growth, 1500–1644 542 • 21-4b Ming Collapse and the Rise of the Qing 542 • 21-4c Emperor Kangxi 546 • 21-4d Tea and Diplomacy 546 • 21-4e Population Growth and Environmental Stress 547

### 21-5 Conclusion 548

Key Terms 549 • Review Questions 549

**ENVIRONMENT & TECHNOLOGY:** East Asian Porcelain 540

**DIVERSITY & DOMINANCE:** The Manchu Moment: From Ming to Qing 544

**MATERIAL CULTURE:** Four-Wheeled Vehicles 550

**ISSUES IN WORLD HISTORY:** The Little Ice Age 552

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## PART VI Revolutions Reshape the World, 1750–1870

554

## 22 The Early Industrial Revolution, 1760–1851 556

### 22-1 Causes of the Industrial Revolution 558

22-1a Population Growth 558 • 22-1b The Agricultural Revolution 558 • 22-1c Trade and Inventiveness 559 • 22-1d Britain and Continental Europe 560

### 22-2 The Technological Revolution 563

22-2a Mass Production: Pottery 563 • 22-2b Mechanization: The Cotton Industry 564 • 22-2c The Iron Industry 566 • 22-2d The Steam Engine 567 • 22-2e Railroads 569 • 22-2f Communication over Wires 570

### 22-3 The Impact of the Early Industrial Revolution 571

22-3a The New Industrial Cities 571 • 22-3b Rural Environments 572 • 22-3c Working Conditions 572 • 22-3d Changes in Society 575

### 22-4 New Economic and Political Ideas 576

22-4a Laissez Faire and Its Critics 577 • 22-4b Protests and Reforms 578

### 22-5 The Limits of Industrialization Outside the West 580

22-5a Egypt 580 • 22-5b India 580 • 22-5c China 581

### 22-6 Conclusion 582

Key Terms 583 • Review Questions 583

**DIVERSITY & DOMINANCE:** Adam Smith and the Division of Labor 564

**ENVIRONMENT & TECHNOLOGY:** Gas Lighting 574



## 23 Revolutionary Changes in the Atlantic World, 1750–1850 584

### 23-1 Prelude to Revolution: The Eighteenth-Century Crisis 586

23-1a Colonial Wars and Fiscal Crises 586 • 23-1b The Enlightenment and the Old Order 586 • 23-1c Folk Cultures and Popular Protest 589

### 23-2 The American Revolution, 1775–1800 590

23-2a Frontiers and Taxes 590 • 23-2b The Course of Revolution, 1775–1783 592 • 23-2c The Construction of Republican Institutions, to 1800 594

### 23-3 The French Revolution, 1789–1815 595

23-3a French Society and Fiscal Crisis 595 • 23-3b Protest Turns to Revolution, 1789–1792 596 • 23-3c The Terror, 1793–1794 597 • 23-3d Reaction and the Rise of Napoleon, 1795–1815 600

### 23-4 Revolution Spreads, Conservatives Respond, 1789–1850 604

23-4a The Haitian Revolution, 1789–1804 604 • 23-4b The Congress of Vienna and Conservative Retrenchment, 1815–1820 606 • 23-4c Nationalism, Reform, and Revolution, 1821–1850 607

### 23-5 Conclusion 608

Key Terms 609 • Review Questions 609

**ENVIRONMENT & TECHNOLOGY:** The Guillotine 599

**DIVERSITY & DOMINANCE:** Madame de Staël Remembers Napoleon 601

## 24 Land Empires in the Age of Imperialism, 1800–1870 610

### 24-1 The Ottoman Empire 611

24-1a Egypt and the Napoleonic Example 612 • 24-1b Ottoman Reform and the European Model, 1807–1853 612 • 24-1c The Crimean War and Its Aftermath 617

### 24-2 The Russian Empire 619

24-2a Russia and Europe 619 • 24-2b Russia and Asia 620 • 24-2c Cultural Trends 622

### 24-3 The Qing Empire 623

24-3a Economic and Social Disorder 623 • 24-3b The Opium War and Its Aftermath, 1839–1850 623 • 24-3c The Taiping Rebellion, 1850–1864 626 • 24-3d Decentralization at the End of the Qing Empire, 1864–1875 629

### 24-4 Conclusion 632

Key Terms 633 • Review Questions 633

**ENVIRONMENT & TECHNOLOGY:** The Web of War 620

**DIVERSITY & DOMINANCE:** Chinese Responses to Imperialism 630

## 25 Nation Building and Economic Transformation in the Americas, 1800–1890 634

### 25-1 Independence in Latin America, 1800–1830 636

25-1a Roots of Revolution, to 1810 636 • 25-1b Spanish South America, 1810–1825 636 • 25-1c Mexico, 1810–1823 639 • 25-1d Brazil, to 1831 640

### 25-2 The Problem of Order, 1825–1890 640

25-2a Constitutional Experiments 641 • 25-2b Personalist Leaders 641 • 25-2c The Threat of Regionalism 645 • 25-2d Foreign Interventions and Regional Wars 645 • 25-2e Native Peoples and the Nation-State 648

### 25-3 The Challenge of Social and Economic Change 650

25-3a The Abolition of Slavery 650 • 25-3b Immigration 652 • 25-3c American Cultures 654 • 25-3d Women's Rights and the Struggle for Social Justice 655 • 25-3e Development and Underdevelopment 656 • 25-3f Altered Environments 659

### 25-4 Conclusion 660

Key Terms 661 • Review Questions 661

**DIVERSITY & DOMINANCE:** The Afro-Brazilian Experience, 1828 642

**ENVIRONMENT & TECHNOLOGY:** Industrializing Sugar Agriculture in Cuba 657

**MATERIAL CULTURE:** Cotton Clothing 662

**ISSUES IN WORLD HISTORY:** State Power, the Census, and the Question of Identity 664

## PART VII Global Diversity and Dominance, 1750–1945

666

## 26 Varieties of Imperialism in Africa, India, Southeast Asia, and Latin America, 1750–1914 668

### 26-1 Changes and Exchanges in Africa 670

26-1a Southern Africa 670 • 26-1b West and Equatorial Africa 673 • 26-1c The Berlin

Conference 674 • 26-1d Modernization in Egypt and Ethiopia 676 • 26-1e Transition from the Slave Trade 677 • 26-1f Secondary Empire in Eastern Africa 678

### 26-2 India Under British Rule 679

26-2a East India Company 679 • 26-2b Political Reform and Industrial Impact 680 • 26-2c Indian Nationalism 682

**26-3 Southeast Asia and the Pacific 683**

26-3a Australia **683** • 26-3b New Zealand **685** •  
26-3c Hawaii and the Philippines, 1878–1902 **685**

**26-4 Imperialism in Latin America 686**

26-4a American Expansionism and the Spanish-American War, 1898 **687** • 26-4b Economic Imperialism **687** •  
26-4c Revolution and Civil War in Mexico **687** •  
26-4d American Intervention in the Caribbean and Central America, 1901–1914 **690**

**26-5 The World Economy and the Global Environment 691**

26-5a Expansion of the World Economy **691** • 26-5b Free Trade **691** • 26-5c New Labor Migrations **693**

**26-7 Conclusion 694**

Key Terms **695** • Review Questions **695**

**DIVERSITY & DOMINANCE:** Two Africans Recall the Arrival of the Europeans **674**

**ENVIRONMENT & TECHNOLOGY:** Imperialism and Tropical Ecology **692**

**27 The New Power Balance, 1850–1900 696****27-1 New Technologies and the World Economy 698**

27-1a Railroads **698** • 27-1b Steamships and Telegraph Cables **699** • 27-1c The Steel and Chemical Industries **700** • 27-1d Environmental Problems **700** • 27-1e Electricity **701** • 27-1f World Trade and Finance **701**

**27-2 Social Changes 703**

27-2a Population and Migration **703** • 27-2b Urbanization and Urban Environments **703** • 27-2c Middle-Class Women’s “Separate Sphere” **705** • 27-2d Working-Class Women **707**

**27-3 Socialism and Labor Movements 708**

27-3a Revolutionary Alternatives **708** • 27-3b Labor Unions and Movements **709**

**27-4 Nationalism and the Rise of Italy, Germany, and Japan 710**

27-4a Language and National Identity in Europe Before 1871 **710** • 27-4b The Unification of Italy, 1860–1870 **711** •  
27-4c The Unification of Germany, 1866–1871 **711** •  
27-4d The West Challenges Japan **714** • 27-4e The Meiji Restoration and the Modernization of Japan, 1868–1894 **716** • 27-4f Nationalism and Social Darwinism **718**

**27-5 The Great Powers of Europe, 1871–1900 719**

27-5a Germany at the Center of Europe **719** • 27-5b The Liberal Powers: France and Great Britain **720** • 27-5c The Conservative Powers: Russia and Austria-Hungary **721**

**27-6 China, Japan, and the Western Powers 722**

27-6a China in Turmoil **722** • 27-6b Japan Confronts China **722**

**27-7 Conclusion 724**

Key Terms **725** • Review Questions **725**

**ENVIRONMENT & TECHNOLOGY:** Railroads and Immigration **704**

**DIVERSITY & DOMINANCE:** Giuseppe Mazzini on Revolutionary Nationalism **714**

**28 The Crisis of the Imperial Order, 1900–1929 726****28-1 Origins of the Crisis in Europe and the Middle East 727**

28-1a The Ottoman Empire and the Balkans **728** •  
28-1b Nationalism, Alliances, and Military Strategy **728**

**28-2 The “Great War” and the Russian Revolutions, 1914–1918 729**

28-2a Stalemate, 1914–1917 **731** • 28-2b The Home Front and the War Economy **732** • 28-2c The Ottoman Empire at War **734** • 28-2d Double Revolution in Russia **735** • 28-2e The End of the War in Western Europe, 1917–1918 **736**

**28-3 Peace and Dislocation in Europe, 1919–1929 737**

28-3a The Impact of the War **737** • 28-3b The Peace Treaties **737** • 28-3c Russian Civil War and the New Economic Policy **738** • 28-3d An Ephemeral Peace **739**

**28-4 China and Japan: Contrasting Destinies 740**

28-4a Social and Economic Change **740** •  
28-4b Revolution and War, 1900–1918 **742** •  
28-4c Chinese Warlords and the Guomindang, 1919–1929 **742**

**28-5 The New Middle East 743**

28-5a The Mandate System **743** • 28-5b The Rise of Modern Turkey **744** • 28-5c Arab Lands and the Question of Palestine **746**

**28-6 Conclusion 749**

Key Terms **749** • Review Questions **749**

**ENVIRONMENT & TECHNOLOGY:** New War, New Tools **733**

**DIVERSITY & DOMINANCE:** The Middle East After World War I **744**

**29 The Collapse of the Old Order, 1929–1949 750****29-1 The Stalin Revolution 752**

29-1a Five-Year Plans **752** • 29-1b Collectivization of Agriculture **752** • 29-1c Terror and Opportunities **753**

**29-2 The Depression 754**

29-2a Economic Crisis **754** • 29-2b Depression in Industrial Nations **755** • 29-2c Depression in Nonindustrial Regions **756**

**29-3 The Rise of Fascism 757**

29-3a Mussolini's Italy **758** • 29-3b Hitler's Germany **758** • 29-3c The Road to War, 1933–1939 **759**

**29-4 East Asia, 1931–1945 760**

29-4a The Manchurian Incident of 1931 **760** • 29-4b The Long March **761** • 29-4c The Sino-Japanese War, 1937–1945 **762**

**29-5 The Second World War 763**

29-5a The War of Movement **763** • 29-5b War in Europe and North Africa **764** • 29-5c War in Asia and the Pacific **766** • 29-5d The End of War **766** • 29-5e Collapse of the Guomindang and Communist Victory **768**

**29-6 The Character of Warfare 769**

29-6a The Science and Technology of War **770** • 29-6b Bombing Raids **770** • 29-6c The Holocaust **771** • 29-6d The Home Front in Europe and Asia **771** • 29-6e The Home Front in the United States **772** • 29-6f War and the Environment **773**

**29-7 Conclusion 774**

Key Terms **775** • Review Questions **775**

**DIVERSITY & DOMINANCE:** Women, Family Values, and the Russian Revolution **756**

**ENVIRONMENT & TECHNOLOGY:** Intelligence and Technology in World War II **772**

**30 Revolutions in Living, 1900–1950 776****30-1 New Technology Outside the Industrialized World 778**

30-1a Urbanization **778** • 30-1b Electricity **780** • 30-1c New Media **780**

**30-2 New Ways of Living in The Industrialized World 782**

30-2a Identity **782** • 30-2b Women's Lives **782** • 30-2c Revolution in the Sciences: The New Physics **783** • 30-2d The New Social Sciences **783** • 30-2e New Technologies and Activities **784** • 30-2f Technology and the Environment **786**

**30-3 A New India, 1905–1947 787**

30-3a The Land and the People **788** • 30-3b British Rule and Indian Nationalism **789** • 30-3c Mahatma Gandhi and Militant Nonviolence **791** • 30-3d India Moves Toward Independence **792** • 30-3e Partition and Independence **794**

**30-4 Mexico, Argentina, and Brazil, 1917–1949 794**

30-4a The Cárdenas Reforms **795** • 30-4b The Transformation of Argentina **795** • 30-4c Brazil and Argentina, to 1929 **795** • 30-4d The Depression and the Vargas Regime in Brazil **796** • 30-4e Argentina After 1930 **797**

**30-5 Sub-Saharan Africa, 1900–1945 797**

30-5a Colonial Africa: Economic and Social Changes **798** • 30-5b Religious and Political Changes **799** • 30-5c Africa and the New Media **800**

**30-6 Conclusion 800**

Key Terms **801** • Review Questions **801**

**ENVIRONMENT & TECHNOLOGY:** New Materials **785**

**DIVERSITY & DOMINANCE:** Gandhi and the Media **792**

**MATERIAL CULTURE:** Roads **802**

**ISSUES IN WORLD HISTORY:** Famines and Politics **804**

**PART VIII Perils and Promises of a Global Community, 1945 to the Present**

806

**31 The Cold War and Decolonization, 1945–1975 808****31-1 The Cold War 810**

31-1a The United Nations **810** • 31-1b Capitalism and Communism **811** • 31-1c West versus East in Europe and Korea **814** • 31-1d The United States and Vietnam **816** • 31-1e The Race for Nuclear Supremacy **818**

**31-2 Decolonization and Nation Building 819**

31-2a New Nations in South and Southeast Asia **819** • 31-2b The Struggle for Independence in

Africa **821** • 31-2c The Quest for Economic Freedom in Latin America **823**

**31-3 Beyond a Bipolar World 827**

31-3a The Third World **827** • 31-3b Japan and China **828** • 31-3c The Middle East **829** • 31-3d The Emergence of Environmental Concerns **832**

**31-4 Conclusion 832**

Key Terms **833** • Review Questions **833**

**ENVIRONMENT & TECHNOLOGY:** The Green Revolution **812**

**DIVERSITY & DOMINANCE:** Race and the Struggle for Justice in South Africa **824**



## 32 The End of the Cold War and the Challenge of Economic Development and Immigration, 1975–2000 834

### 32-1 Postcolonial Crises and Asian Economic Expansion 836

32-1a Revolutions, Repression, and Democratic Reform in Latin America **836** • 32-1b Islamic Revolutions in Iran and Afghanistan **839** • 32-1c Asian Transformation **841** • 32-1d China Rejoins the World Economy **843**

### 32-2 The End of the Bipolar World 845

32-2a Crisis in the Soviet Union **845** • 32-2b The Collapse of the Socialist Bloc **845** • 32-2c Africa in the Era of Global Political Change **847** • 32-2d The Persian Gulf War **848**

### 32-3 The Challenge of Population Growth 848

32-3a Demographic Transition **848** • 32-3b The Industrialized Nations **851** • 32-3c The Developing Nations **851** • 32-3d Old and Young Populations **852**

### 32-4 Unequal Development and the Movement of Peoples 852

32-4a The Problem of Inequality **853** • 32-4b Internal Migration: The Growth of Cities **853** • 32-4c Global Migration **855**

### 32-5 Technological and Environmental Change 857

32-5a New Technologies and the World Economy **857** • 32-5b Conserving and Sharing Resources **859** • 32-5c Responding to Environmental Threats **861**

### 32-6 Conclusion 862

Key Terms **863** • Review Questions **863**

**DIVERSITY & DOMINANCE:** The Struggle for Women’s Rights in an Era of Global Political and Economic Change **842**

**ENVIRONMENT & TECHNOLOGY:** Connected **858**

## 33 Leaving the Twentieth Century 864

### 33-1 The Question of Values 866

33-1a Faith and Politics **866** • 33-1b Terrorism **866** • 33-1c Regime Change in the Muslim World **869** • 33-1d North Korea and Iran **872** • 33-1e Hezbollah and Hamas **872** • 33-1f Muslims and Violence **873** • 33-1g Christians and Jews **873** • 33-1h Universal Rights and Values **873** • 33-1i Nongovernmental Organizations **874** • 33-1j Women’s Rights **876**

### 33-2 Globalization and Economic Crisis 877

33-2a Global Financial Crisis **878** • 33-2b Regional Trade Organizations **879** • 33-2c World Trade Organization **879** • 33-2d From Obama to Trump **881** • 33-2e Globalization and Democracy **881** • 33-2f Eastern Europe **882** • 33-2g Democracy in Asia **882** • 33-2h Instability in Pakistan and Turkey **882** • 33-2i African Regimes **883**

### 33-3 Global Culture 883

33-3a The Media and the Message **884** • 33-3b Global Communication **884** • 33-3c The Spread of Popular Culture **885** • 33-3d Emerging Global Elite Culture **886** • 33-3e Global Science and University Education **886** • 33-3f Enduring Cultural Diversity **887**

### 33-4 Conclusion 888

Key Terms **889** • Review Questions **889**

**DIVERSITY & DOMINANCE:** Conflict and Civilization **870**

**ENVIRONMENT & TECHNOLOGY:** Global Warming **875**

**MATERIAL CULTURE:** Fast Food **890**

**ISSUES IN WORLD HISTORY:** Popular Culture—Words of Warning **891**

## Index I-1

# Maps



- 1.1** Human Dispersal to 10,000 Years Ago **9**
- 1.2** Early Centers of Plant and Animal Domestication **18**
- 2.1** River-Valley Civilizations, 3500–1500 BCE **28**
- 2.2** Mesopotamia **30**
- 2.3** Ancient Egypt **39**
- 3.1** The Middle East in the Second Millennium BCE **52**
- 3.2** Minoan and Mycenaean Civilizations of the Aegean **58**
- 3.3** The Assyrian Empire **62**
- 3.4** Phoenicia and Israel **65**
- 3.5** Colonization of the Mediterranean **73**
- 3.6** The Voyage of Hanno the Carthaginian **75**
- 4.1** China in the Shang and Zhou Periods, 1750–221 BCE **85**
- 4.2** Ancient Nubia **94**
- 4.3** Pastoral Nomads of the Eurasian Steppes **97**
- 4.4** The Celtic Peoples **101**
- 5.1** The Persian Empire Between 550 and 522 BCE **114**
- 5.2** Ancient Greece **121**
- 5.3** Hellenistic Civilization **137**
- 6.1** The Roman Empire **146**
- 6.2** Han China **159**
- 7.1** Ancient India **172**
- 7.2** Southeast Asia **187**
- 8.1** Olmec and Chavin Civilizations **196**
- 8.2** Maya Civilization, 250–1400 CE **201**
- 8.3** Postclassic Mesoamerica **206**
- 8.4** Culture Areas of North America **208**
- 8.5** Andean Civilizations, 200 BCE–1532 CE **211**
- 9.1** Asian Trade and Communication Routes **227**
- 9.2** Africa and the Trans-Saharan Trade Routes **235**
- 10.1** Early Expansion of Muslim Rule **249**
- 10.2** Rise and Fall of the Abbasid Caliphate **255**
- 11.1** The Spread of Christianity **272**
- 11.2** Germanic Kingdoms Prior to Islam **274**
- 11.3** Kievan Russia and the Byzantine Empire in the Eleventh Century **284**
- 11.4** The Crusades **289**
- 12.1** The Tang Empire in Central and Eastern Asia, 750 **296**
- 12.2** Liao and Song Empires, ca. 1100 **302**
- 12.3** Jin and Southern Song Empires, ca. 1200 **302**
- 13.1** The Mongol Domains in Eurasia in 1300 **323**
- 13.2** Western Eurasia in the 1300s **328**
- 13.3** The Ming Empire and Its Allies, 1368–1500 **336**
- 13.4** Korea and Japan, 1200–1500 **341**
- 14.1** The Black Death in Fourteenth-Century Europe **348**
- 14.2** Europe in 1453 **360**
- 15.1** Africa and the Indian Ocean Basin: Physical Characteristics **370**
- 15.2** Africa, 1200–1500 **373**
- 15.3** South and Southeast Asia, 1200–1500 **375**
- 15.4** Arteries of Trade and Travel in the Islamic World, to 1500 **379**
- 15.5** Major Mesoamerican Civilizations, 1000 BCE–1519 CE **387**
- 16.1** Exploration and Settlement in the Indian and Pacific Oceans Before 1500 **398**
- 16.2** Middle America to 1533 **400**
- 16.3** European Exploration, 1420–1542 **404**
- 17.1** Religious Reformation in Europe **429**
- 17.2** The European Empire of Charles V **442**
- 17.3** Europe in 1740 **446**
- 18.1** Colonial Latin America in the Eighteenth Century **458**
- 18.2** European Claims in North America, 1755–1763 **474**
- 19.1** The Atlantic Economy **492**
- 19.2** The African Slave Trade, 1500–1800 **494**
- 19.3** West African States and Trade, 1500–1800 **496**
- 20.1** Muslim Empires in the Sixteenth and Seventeenth Centuries **510**
- 20.2** The Expansion of Russia, 1500–1800 **524**
- 20.3** European Colonization in the Indian Ocean, to 1750 **529**
- 21.1** The Qing Empire, 1644–1783 **543**
- 21.2** Climate and Diversity in the Qing Empire **548**
- 22.1** The Industrial Revolution in Britain, ca. 1850 **561**
- 22.2** Industrialization in Europe, ca. 1850 **570**
- 23.1** The American Revolutionary War **593**
- 23.2** Napoleon's Europe, 1810 **603**
- 23.3** The Haitian Revolution **606**
- 24.1** The Ottoman and Russian Empires, 1829–1914 **614**
- 24.2** Conflicts in the Qing Empire, 1839–1870 **625**
- 25.1** Latin America by 1830 **638**
- 25.2** Dominion of Canada, 1873 **644**
- 25.3** Territorial Growth of the United States, 1783–1853 **646**
- 25.4** The Expansion of the United States, 1850–1920 **658**
- 26.1** Africa in the Nineteenth Century **672**
- 26.2** Asia in 1914 **684**
- 26.3** The Mexican Revolution **689**
- 27.1** Unification of Italy, 1860–1870 **712**
- 27.2** Unification of Germany, 1866–1871 **713**
- 27.3** Expansion and Modernization of Japan, 1868–1918 **717**
- 28.1** The First World War in Europe **730**
- 28.2** Territorial Changes in Europe After World War I **734**
- 28.3** Territorial Changes in the Middle East After World War I **746**
- 29.1** Chinese Communist Movement and the Sino-Japanese War, to 1938 **762**
- 29.2** World War II in Europe and North Africa **765**
- 29.3** World War II in Asia and the Pacific **767**
- 30.1** The Partition of India, 1947 **788**

**xx** Maps

<b>31.1</b>	Cold War Confrontation	<b>815</b>	<b>32.2</b>	World Population Growth	<b>854</b>
<b>31.2</b>	Decolonization, 1947–1990	<b>820</b>	<b>32.3</b>	Fresh Water Resources	<b>860</b>
<b>31.3</b>	Middle East Oil and the Arab–Israeli Conflict, 1947–1973	<b>831</b>	<b>33.1</b>	World Religions	<b>868</b>
<b>32.1</b>	The End of the Soviet Union	<b>847</b>	<b>33.2</b>	Global Distribution of Wealth	<b>877</b>
			<b>33.3</b>	Regional Trade Associations, 2004	<b>880</b>



# Features



## Environment & Technology

- The Iceman **16**
- Environmental Stress in the Indus Valley **47**
- The West African Voyage of Hanno the Carthaginian **74**
- Divination in Ancient Societies **86**
- Ancient Astronomy **138**
- Ancient Glass **154**
- Indian Mathematics **182**
- The Maya Writing System **203**
- Nomad Homes **228**
- Chemistry **265**
- Iron Production **278**
- East Asian Transportation **305**
- From Gunpowder to Guns **338**
- Stained-Glass Windows **355**
- The Indian Ocean Dhow **380**
- Vasco da Gama's Fleet **405**
- Mapping the World **438**
- A Silver Refinery at Potosí, 1700 **461**
- Natural Disasters and the Caribbean Plantation Economy **484**
- Persian Rugs **520**
- East Asian Porcelain **540**
- Gas Lighting **574**
- The Guillotine **599**
- The Web of War **620**
- Industrializing Sugar Agriculture in Cuba **657**
- Imperialism and Tropical Ecology **692**
- Railroads and Immigration **704**
- New War, New Tools **733**
- Intelligence and Technology in World War II **772**
- New Materials **785**
- The Green Revolution **812**
- Connected **858**
- Global Warming **875**



## Diversity & Dominance

- Cave Art **12**
- Violence and Order in the Babylonian New Year's Festival **36**
- Protests Against the Ruling Class in Israel and Babylonia **70**
- Human Nature and Good Government in the *Analects* of Confucius and the Legalist Writings of Han Fei **90**
- Poetry and Society in Early China and Greece **126**
- Socioeconomic Mobility: Winners and Losers in Imperial Rome and Han China **150**
- Relations Between Women and Men in the *Kama Sutra* and the *Arthashastra* **184**
- Burials as Historical Texts **214**
- Travel Accounts of Africa and India **232**
- Becoming Muslim **262**
- The Struggle for Christian Morality **280**
- Law and Society in China and Japan **298**
- The Secret History of the Mongols **324**
- Persecution and Protection of Jews, 1272–1349 **352**
- Justice and Kingship **376**
- Understanding Cross-Cultural Encounters **410**
- Commercial Expansion and Risk **440**
- Race and Ethnicity in the Spanish Colonies: Negotiating Hierarchy **464**
- Slavery in West Africa and the Americas **502**
- Islamic Law and Ottoman Rule **512**
- The Manchu Moment: From Ming to Qing **544**
- Adam Smith and the Division of Labor **564**
- Madame de Staël Remembers Napoleon **601**
- Chinese Responses to Imperialism **630**
- The Afro-Brazilian Experience, 1828 **642**
- Two Africans Recall the Arrival of the Europeans **674**
- Giuseppe Mazzini on Revolutionary Nationalism **714**
- The Middle East After World War I **744**
- Women, Family Values, and the Russian Revolution **756**
- Gandhi and the Media **792**
- Race and the Struggle for Justice in South Africa **824**
- The Struggle for Women's Rights in an Era of Global Political and Economic Change **842**
- Conflict and Civilization **870**



## Material Culture

Wine and Beer in the Ancient World **106**  
Bells, Gongs, and Drums **219**  
Salt **313**  
Head Coverings **418**

Four-Wheeled Vehicles **550**  
Cotton Clothing **662**  
Roads **802**  
Fast Food **890**



## Issues in World History

Animal Domestication **108**  
Oral Societies and the Consequences of Literacy **220**  
Religious Conversion **314**  
Climate and Population to 1500 **420**

The Little Ice Age **552**  
State Power, the Census, and the Question of Identity **664**  
Famines and Politics **804**  
Popular Culture—Words of Warning **891**

# 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).

## MindTap

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 MindTap 1-Semester Printed Access Code: ISBN 9781337401579  
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 MindTap 2-Semester Printed Access Code: ISBN 9781337401524

MindTap for *The Earth and Its Peoples*, 7e, is a flexible, online learning platform that provides students with an immersive learning experience to build and foster critical thinking skills. Through a carefully designed chapter-based learning path, MindTap allows students to easily identify learning objectives; draw connections and improve writing skills by completing unit-level essay assignments; read short, manageable sections from the e-book; and test their content knowledge with map- and timeline-based critical thinking questions.

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**Doing History: Research and Writing in the Digital Age, 2e ISBN 9781133587880** Prepared by Michael J. Galgano, J. Chris Arndt, and Raymond M. Hyser of James Madison University. Whether you're starting down the path as a history major or simply looking for a straightforward, systematic guide to writing a successful paper, this text's "soup to nuts" approach to researching and writing about history addresses every step of the process: locating your sources, gathering information, writing and citing according to various style guides, and avoiding plagiarism.

**Writing for College History, 1e ISBN 9780618306039** Prepared by Robert M. Frakes of Clarion University. This brief handbook for survey courses in American, western, and world history guides students through the various types of writing assignments they may encounter in a history class. Providing examples of student writing and candid assessments of student work, this text focuses on the rules and conventions of writing for the college history course.

**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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## Acknowledgments

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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 *kipu* (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

CHAPTER 1 Nature, Humanity, and History, to 3500 BCE

CHAPTER 2 The First River-Valley Civilizations, 3500–1500 BCE

CHAPTER 3 The Mediterranean and Middle East, 2000–500 BCE

CHAPTER 4 New Civilizations Outside the West Asian Core Area, 2300 BCE–350 CE

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

### 1-1 African Genesis

- 1-1a Interpreting the Evidence
- 1-1b Human Evolution
- 1-1c Migrations from Africa

### 1-2 Technology and Culture in the Ice Age

- 1-2a Food Gathering and Stone Tools
- 1-2b Gender Roles and Social Life
- 1-2c Hearths and Cultural Expressions

### 1-3 The Agricultural Revolutions

- 1-3a The Transition to Plant Cultivation
- 1-3b Domesticated Animals and Pastoralism
- 1-3c Agricultural and Ecological Crisis

### 1-4 Life in Neolithic Communities

- 1-4a The Triumph of Food Producers
- 1-4b Cultural Expressions
- 1-4c Early Towns and Specialists

### 1-5 Conclusion

#### ➤ DIVERSITY & DOMINANCE

Cave Art

#### ➤ ENVIRONMENT & TECHNOLOGY

The Iceman

**P**aintings 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

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.

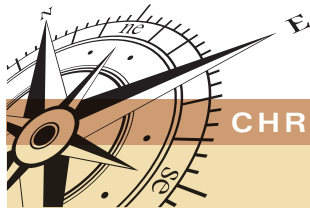
**evolution** The biological theory that, over time, changes occurring in plants and animals, mainly as a result of natural selection and genetic mutation, result in new species.

**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.





## CHRONOLOGY

	Geological Epochs	Species and Migrations	Technological Advances
<b>7,000,000 BCE</b>		7,000,000 BCE Earliest hominids	
<b>4,000,000 BCE</b>		4,500,000 BCE Australopithecines 2,300,000 BCE Early <i>Homo habilis</i>	2,600,000 BCE Earliest stone tools; hunting-and-gathering (foraging) societies
<b>2,000,000 BCE</b>	2,000,000–9000 BCE Pleistocene (Great Ice Age)	1,800,000–350,000 BCE <i>Homo erectus</i>	2,000,000–8000 BCE Paleolithic (Old Stone Age)
<b>1,000,000 BCE</b>			500,000 BCE Use of fire
<b>200,000 BCE</b>		200,000–100,000 BCE Anatomically modern <i>Homo sapiens</i> in Africa 80,000–50,000 BCE Behaviorally modern <i>Homo sapiens</i> 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
<b>10,000 BCE</b>	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.



▲ **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.



▲ **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.

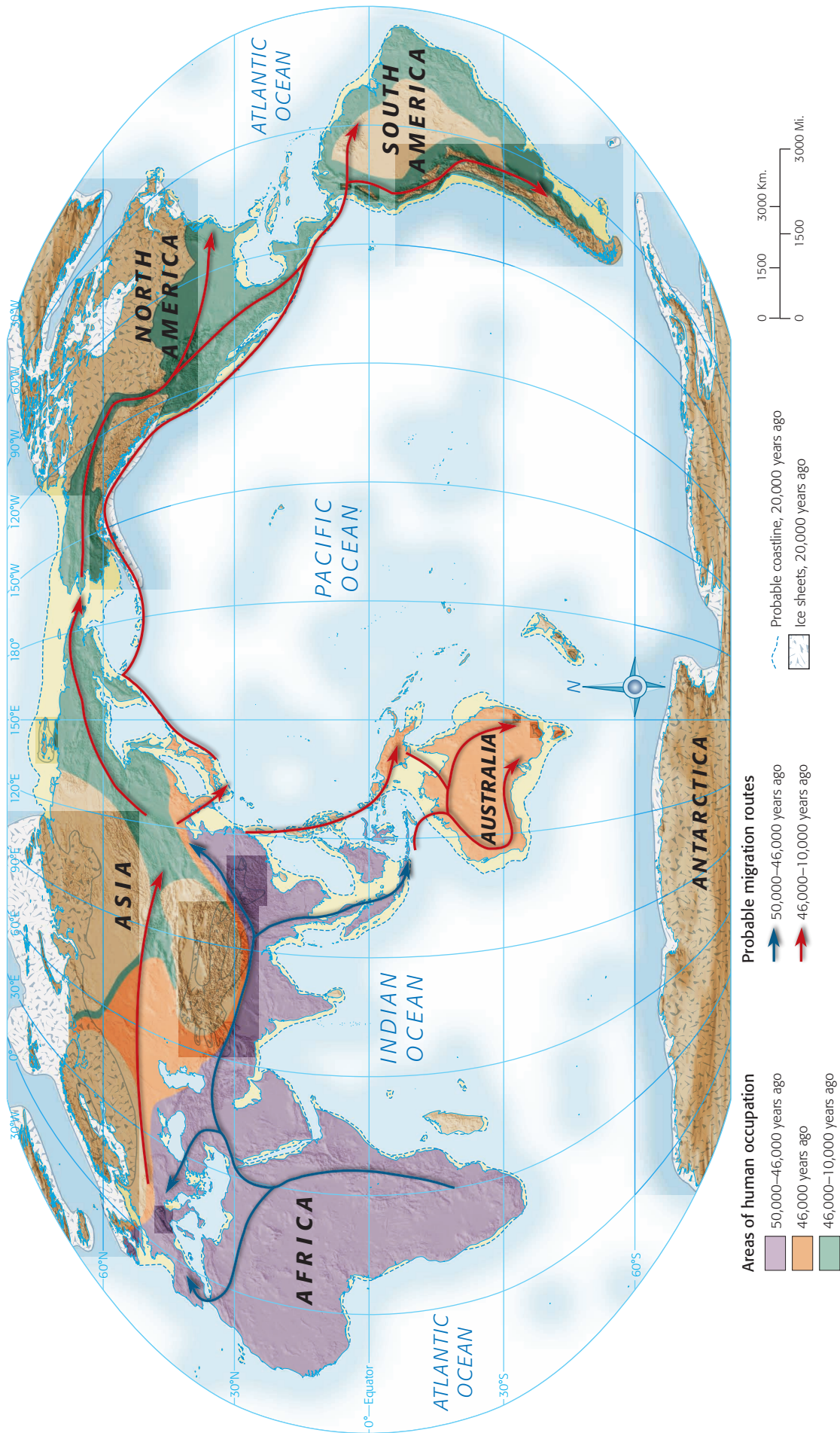
## 1-1c Migrations from Africa

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

***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.



**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?