

ROOTS AND MEANING OF CULTURE:

Introduction



South African San hunter-gatherers are modern-day followers of the world's oldest, most enduring livelihood system.

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AP Learning Objectives

- Define the characteristics, attitudes, and traits that influence geographers when they study culture.
- Describe the characteristics of cultural landscapes.
- Explain how landscape features and land and resource use reflect cultural beliefs and identities.
- Define the types of diffusion.
- Explain how historical processes impact current cultural patterns.

They buried him there in the cave where they were working, less than 6 kilometers (4 miles) from the edge of the ice sheet. Outside stretched the tundra, summer feeding grounds for the mammoths whose ivory they had come so far to collect. Inside, near where they dug his grave, were stacked the tusks that they had gathered and were cutting and shaping. They prepared the body carefully and dusted it with red ocher, then buried it in an elaborate grave with tundra flowers and offerings of food, a bracelet on its arm, a pendant about its throat, and 40 to 50 polished rods of ivory by its side. It rested there, in modern Wales, undisturbed for some 18,000 years until discovered early in the 19th century. The 25-year-old hunter had died far from the group's home, some 650 kilometers (400 miles) away, near present-day Paris, France. He had been part of a routine annual summer expedition overland from the forested south across the as-yet-unflooded English Channel to the mammoths' grazing grounds at the edge of the glacier.

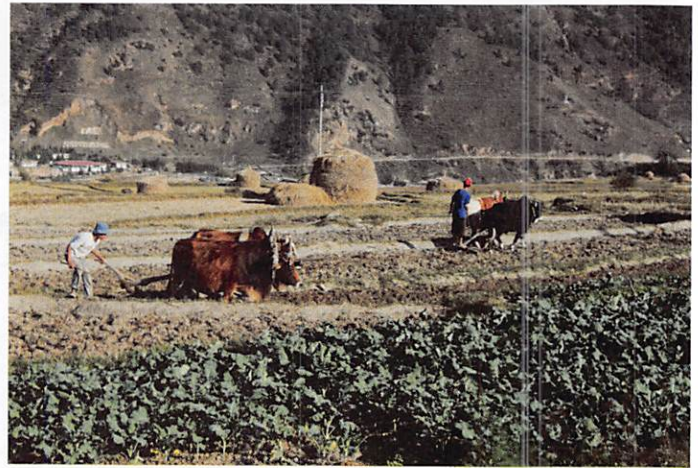
As always, they were well prepared for the trip. Their boots were carefully made. Their sewn-skin leggings and tunics served well for travel and work; heavier fur parkas warded off the evening chill. They carried emergency food, fire-making equipment, and braided cord that they could fashion into nets, fishing lines, ropes, or thread. They traveled by reference to sun and stars, recognizing landmarks from past journeys and occasionally consulting a crude map etched on bone.

Although the hunters returned bearing the sad news of their companion's death, they also brought the ivory to be carved and traded among the scattered peoples of Europe, from the Atlantic Ocean to the Ural Mountains.

As shown by their tools and equipment, their behaviors and beliefs, these Stone Age travelers displayed highly developed and distinctive characteristics, primitive only from the vantage point of our own different technologies and customs. They represented the culmination of a long history of development of skills, of invention of tools, and of creation of lifestyles that set them apart from peoples elsewhere in Europe, Asia, and Africa, who possessed still different cultural heritages.

To writers in newspapers and the popular press, the word *culture* means the arts (literature, painting, music, and the like). To a social scientist, however, **culture** is the specialized behavioral patterns, understandings, adaptations, and social systems that summarize a group of people's learned way of life. In this broader sense, culture is an ever-present part of the regional differences that are the essence of human geography. The visible and invisible evidences of culture—buildings and farming patterns, language, political organization, and ways of earning a living, for example—are all parts of the spatial diversity that human geographers study. Cultural differences over time may present contrasts as great as those between the Stone Age ivory hunters and modern urban Americans. Cultural differences in space result in human landscapes with variations as subtle as the differing “feel” of urban Paris, Moscow, or New York, or as obvious as the sharp contrasts of rural and the U.S. Midwest (**Figure 2.1**).

Because such tangible and intangible cultural differences exist and have existed in various forms for thousands of years, human geography attempts first to describe the pattern



(a)



(b)

Figure 2.1 Culture is reflected in agricultural practices and in the look of the landscape. Compare (a) farmers using oxen to plow fields for planting in Bhutan and (b) the extensive fields and mechanized farming of the U.S. Midwest.

(a) ©Lissa Harrison; (b) Source: Tim McCabe, USDA Natural Resource Conservation Service/U.S. Department of Agriculture (USDA)

of cultural practices (traits) across the Earth's surface. Then it addresses the question of why? Why, because humankind constitutes a single species, are cultures so varied? What and where were the origins of the different culture traits we now observe? How, from whatever limited areas individual culture traits developed, were they diffused over a wider portion of the globe? How did people who had roughly similar origins come to display significant areal differences in technology, social structure, ideology, and the innumerable other expressions of human cultural diversity? In what ways and why are there distinctive cultural variations even in presumed “melting pot” societies, such as the United States and Canada, or in the historically homogeneous, long-established countries of Europe? How is knowledge about

cultural differences important to us today? Some of the answers to these questions are to be found in the way that separate human groups developed techniques to solve regionally varied problems such as securing food, clothing, and shelter, and in the process, created distinctive customs and ways of life.

2.1 Components of Culture

Culture is transmitted within a society to succeeding generations by imitation, instruction, suggestion, and example. In short, while the capacity for culture is biological, culture itself is learned. As members of a social group, individuals acquire integrated sets of behavioral patterns, environmental and social perceptions, and knowledge of existing technologies. Of necessity, each of us learns the culture in which we are born and reared. But we need not—indeed, cannot—learn its totality. Age, sex, status, or occupation may dictate aspects of the cultural whole to which an individual is more or less likely to be exposed, and which it is more or less appropriate for an individual to internalize.

A culture, that is, despite overall generalized and identifying characteristics and even an outward appearance of uniformity, displays a social structure—a framework of roles and interrelationships of individuals and established groups. Each individual learns and is expected to adhere to the rules and conventions not only of the culture as a whole, but also of those specific to the subculture to which he or she belongs. And that subgroup may have its own recognized social structure (Figure 2.2). Think back to the different subgroups and aspects of your own national culture that you became part of (and left) as you progressed from childhood through high school and on to college-age adulthood and, perhaps, to first employment.

Many different cultures, then, can coexist within a given area, each with its own influence on the thoughts and behaviors of their separate members. Subcultures are groups that can be distinguished from the wider society by their cultural patterns. Within the United States, for example, we can readily recognize a variety of subcultures within the larger “American” culture: white, black, Hispanic, Asian American, or other ethnic groups; gay and straight; urban and rural; and many others (see the feature “The Burning Man Festival of Art and Music: Subcultural Landscape in the Great Basin Desert”). Human geography increasingly recognizes the pluralism of cultures within regions. In addition to examining the separate content and influence of those subcultures, it attempts to record and analyze the varieties of contested cultural interactions among them, including those of a political and economic nature.

Culture is a complexly interlocked web of behaviors, attitudes, and material artifacts. Realistically, its full and diverse content cannot be appreciated, and in fact may be wholly misunderstood, if we concentrate our attention only on limited, obvious traits. Distinctive eating utensils, the use of gestures, or the ritual of religious ceremony may summarize and characterize a culture for the casual observer. These are, however, individually insignificant parts of a much more complex structure that can be appreciated only when the whole is experienced.



(a)



(b)

Figure 2.2 Both the traditional rice farmer of rural Japan and the Tokyo commuter are part of a common Japanese culture. They occupy, however, vastly different positions in its social structure.

(a) ©KIRAYONAK YULIYA/Shutterstock; (b) ©Jane Rix/123RF

Out of the richness and intricacy of human life, we seek to isolate for special study those more fundamental cultural variables that give structure and spatial order to societies. We begin with *culture traits*, the smallest distinctive units of culture. **Culture traits** range from the language spoken to the tools used or the games played. A trait may be an object (a fishhook, for example), a technique (weaving and knotting of a fishnet), or a belief (in the spirits resident in water bodies). Traits are the most elementary expression of culture, the building blocks of the complex behavioral patterns of distinctive groups of peoples. Of course, the same trait—the Christian religion, perhaps, or the Spanish language—may be part of more than one culture. Similarly, traits are sometimes clearly distinct, as in two completely different rules about the appropriateness of marrying first cousins, or somewhat overlapping, as in preferences for one or the other of two styles of rap music that share many common aspects.

The Burning Man Festival of Art and Music: Subcultural Landscape in the Great Basin Desert

Is it an art festival? A music festival? Just a gathering of like-minded people, or a large yet ephemeral city that springs up anew every late summer in the Black Rock desert playa of northwest Nevada? Maybe it's the world's largest rave. In terms of movie references, it may well remind you of a mashup of *Fear and Loathing in Las Vegas*; *The Adventures of Priscilla, Queen of the Desert*; *Mad Max*; and almost any film by Federico Fellini or Terry Gilliam. A little surrealism, creativity, and positive vibes set to an electronica soundtrack, with some hedonism and fire thrown in for good measure.

This is the Burning Man Festival of Art and Music ("Burning Man" for short). As we have pointed out, people are not only members of a main national culture but of various subcultures. These subcultures are based on a dizzying potential array of characteristics, interests, and facets of identity. They are distinguishable from the wider culture by their particular membership and their distinctive cultural patterns of behaviors, attitudes, and material artifacts. Burning Man is a fascinating example of such a subculture.

Burning Man started in 1986, when the first "Man" effigy was created by Larry Harvey and Jerry James and set on fire as an artistic statement on a San Francisco beach. This spontaneous (and, at the time, illegal) performance was witnessed by just a few handfuls of onlookers who happened to be there. But attendance grew, and in 1990, what had now become an annual event moved to a broad playa in the Black Rock desert of northwest Nevada (within the broader Great Basin). Attendance hit 1,000 "Burners" in 1993; 10,000 in 1997; and 50,000 in 2010. As of 2017, attendance reached nearly 70,000! This makes it temporarily the second largest population agglomeration in all of Nevada, after Las Vegas (Figure 2Aa). Such a large gathering motivates the Burning Man Web site (<https://burningman.org/>) to refer to itself as "one of the great cities of the world". (Technically, our analysis of cities in Chapter 11 suggests that Burning Man would more accurately be considered something like a bedroom suburb with many different central cities located around the world—who says life in the burb's is no fun?)

Burning Man now lasts a little over a week, giving its "residents" ample opportunity to sample its physical and cultural environment. Physically, the playa at Black Rock is a very flat plain of highly alkaline soil. Most days of the festival see high temperatures and copious sun. Temperatures at night typically drop 30°F or more. Wind is also common, with robust dust storms often occurring at least once or twice during the event. But rain can happen too, and when it does, the playa becomes astoundingly mucky.

Clearly, the Burning Man subculture integrates all three components of ideological, technological, and sociological culture. Architectural and sculptural art installations abound; some of them have engines installed that turn the art into transportation—cars and shuttles that might spew flames or emit ominous tones (Figure 2Ab). Burners wear costumes and headdresses and sometimes very little at all. They hang out in theme camps organized around statements of creativity, nonconformity, humor, or simply libertinism. Activities include fireworks and

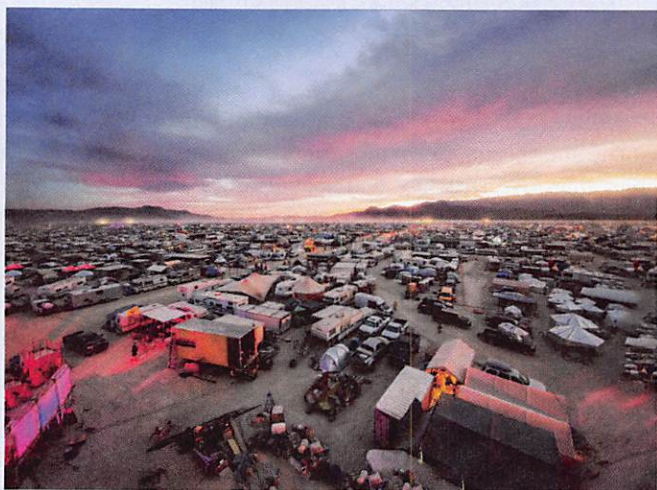


Figure 2A(a) The sun rises over the 2015 Festival.
(a) ©Lukas Bischoff/123RF

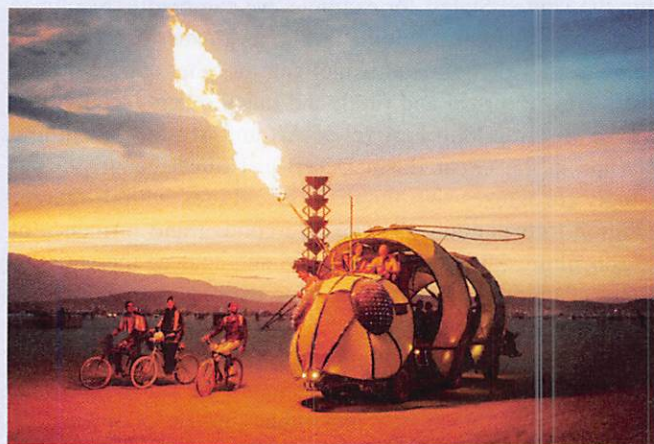


Figure 2A(b) Example of a typical art car and some "Burners" from the 2015 Festival.
(b) ©Lukas Bischoff/123RF

(Continued)

artistic burning events, culminating with the ceremonial burning of the “Man” on the final Saturday evening. Various forms of merriment occur, all accompanied by a nearly constant soundtrack of various types of rock and electronica music, which some might describe as clamor when they must listen to it at 4 A.M. All of this describes the surface appearance of Burning Man, but the ideas underneath it are perhaps what is most intriguing. The Festival claims to carry the torch for guerrilla resistance to the social norms of the wider main national culture, a modern echo of the social movements of

the Beats, the hippies, and other radical free thinkers and doers of times past.

At the end of the Festival, Burners trudge off to their regular lives in the various corners of the globe from which they’ve come. For the great majority of them, these lives must be considerably more sober and conventional than their week or so in the Black Rock desert. One assumes that the last traces of the Festival are hardly cleaned up before the organizers start planning for the next year’s event, the heavily planned reality for what started as a spontaneous act of performance art.

But our discussion should not imply that culture traits exist in isolation—they are always interrelated. Individual cultural traits that are functionally interrelated comprise a **culture complex**. The existence of such complexes is universal. Keeping cattle was a *culture trait* of the Masai of Kenya and Tanzania. Related traits included the measurement of personal wealth by the number of cattle owned, a diet containing the milk and blood of cattle, and disdain for labor unrelated to herding. The assemblage of these and other related traits yielded a culture complex descriptive of one aspect of Masai society (Figure 2.3). In exactly the same way, religious complexes, business behavior complexes, sports complexes, and others can easily be recognized in any society.

In the United States, for example, some environmentalists would like to wean Americans from their automobiles. However, a study of American culture reveals the difficulty in

making such a change because automobiles are part of an interrelated cultural complex. Automobile brands and models speak of a person’s status in U.S. society. Movies, video games, and sports often give automobiles a central role; movies such as *The Fast and the Furious* series, video games such as *Grand Theft Auto*, and NASCAR are familiar examples. Entire suburban landscapes have been built around the needs of the automobile. Even rites of passage often focus on the automobile: driver’s education, passing the driver’s exam, getting one’s first automobile, picking up a date in one’s automobile, and the practice of decorating the newlywed couple’s automobile at the end of the wedding ceremony.

A **cultural system** is a broader generalization than a culture complex and refers to the collection of interacting culture traits and complexes that are shared by a group within a particular territory. Multiethnic societies, perhaps further subdivided by linguistic differences, varied food preferences, and a host of other internal differentiations, may nonetheless share enough joint characteristics to be recognizably distinctive cultural systems to themselves and others. Certainly, citizens of the “melting pot” United States would identify themselves as *Americans*, together constituting a unique culture system on the world scene.

Culture traits, complexes, and systems have a real extent. When they are plotted on maps, the regional character of the components of culture is revealed. Although human geographers are interested in the spatial distribution of these individual elements of culture, their usual concern is with a type of thematic region known as the **culture region**, a portion of the Earth’s surface occupied by populations sharing recognizable and distinctive cultural characteristics. Examples include the political organizations societies devise, the religions they espouse, the form of economy they pursue, and even the type of clothing they wear, eating utensils they use, or kind of housing they occupy. There are as many such conceptual culture regions as there are culture traits and complexes recognized for population groups. Their recognition will be particularly important in the discussions of ethnic, folk, and popular culture that will occur in later chapters of this book. In those later reviews, as within the present chapter, we must keep in mind that within any single recognized culture region, groups united by the specific mapped characteristics may be competing and distinctive in other important culture traits.



Figure 2.3 The formerly migratory Masai of Kenya are now largely sedentary, partially urbanized, and frequently owners of fenced farms. Cattle formed the traditional basis of Masai culture and were evidence of wealth and social status.

©The McGraw-Hill Education/Barry Barker, photographer

Finally, a set of culture regions showing related culture complexes and landscapes may be grouped to form a **culture realm**. The term recognizes a large segment of the Earth's surface having an assumed fundamental uniformity in its cultural characteristics and showing a significant difference in them from adjacent realms. Culture realms are, in a sense, culture regions at the broadest scale of recognition. In fact, the scale is so broad and the diversity within the recognized realms so great that the very concept of realm may mislead more than it informs.

Indeed, the current validity of distinctive culture realms has been questioned in light of an assumed globalization of all aspects of human society and economy. The result of that globalization, it has been suggested, is a homogenization of cultures as economies are integrated and uniform consumer demands are satisfied by standardized commodities produced by international corporations. Certainly, the increasing mobility of people, goods, and information has reduced the rigidly compartmentalized ethnicities, languages, and religions of earlier periods. Cultural flows and exchanges have increased over the recent decades, and with them has come a growing worldwide intermixture of peoples and customs. Despite that growing globalism in all facets of life and economy, however, the world is far from homogenized. Although an increased sameness of commodities and experiences is encountered in distant places, even common and standardized items of everyday life—branded soft drinks, for example, or American fast-food franchises—take on unique regional meanings and roles, conditioned by the total cultural mix they enter. Those multiple regional cultural mixes are often defiantly distinctive and separatist as recurring incidents of ethnic conflict, civil war, and strident regionalism attest. Rather than successfully leveling and removing all regional contrasts, as frequently predicted, globalization continues to be countered by powerful forces of regionalism, place identity, and ethnicity.

If a global culture can be discerned, it may best be seen as a combination of multiple territorial cultures rather than a standardized uniformity. It is those territorially different cultural mixtures that are recognized by the culture realms suggested on **Figure 2.4**, which is only one of many such possible divisions. The spatial pattern and characteristics of these generalized realms will help us place the discussions and examples of human geography of later chapters in their regional contexts. They are commonly employed in courses on world regional geography.

2.2 Interaction of People and Environment

Culture develops in a physical environment that, in its way, contributes to differences among people. In premodern subsistence societies, the acquisition of food, shelter, and clothing, all parts of culture, depends on the utilization of the natural resources at hand. The interrelations of people to the environment of a given area, their perceptions and utilization of it, and their impact on it are interwoven themes of **cultural ecology**—the study of the relationship between a culture group and the natural environment that it occupies.

Cultural ecologists see evidence that subsistence pastoralists, hunter-gatherers, and gardeners adapted their productive activities—and, by extension, their social organizations and relationships—to the specific physical limitations of their different local habitats. Presumably, similar natural environmental conditions influenced the development of similar adaptive responses and cultural outcomes in separate, unconnected locales. That initial influence, of course, does not predetermine the details of the subsequent culture.

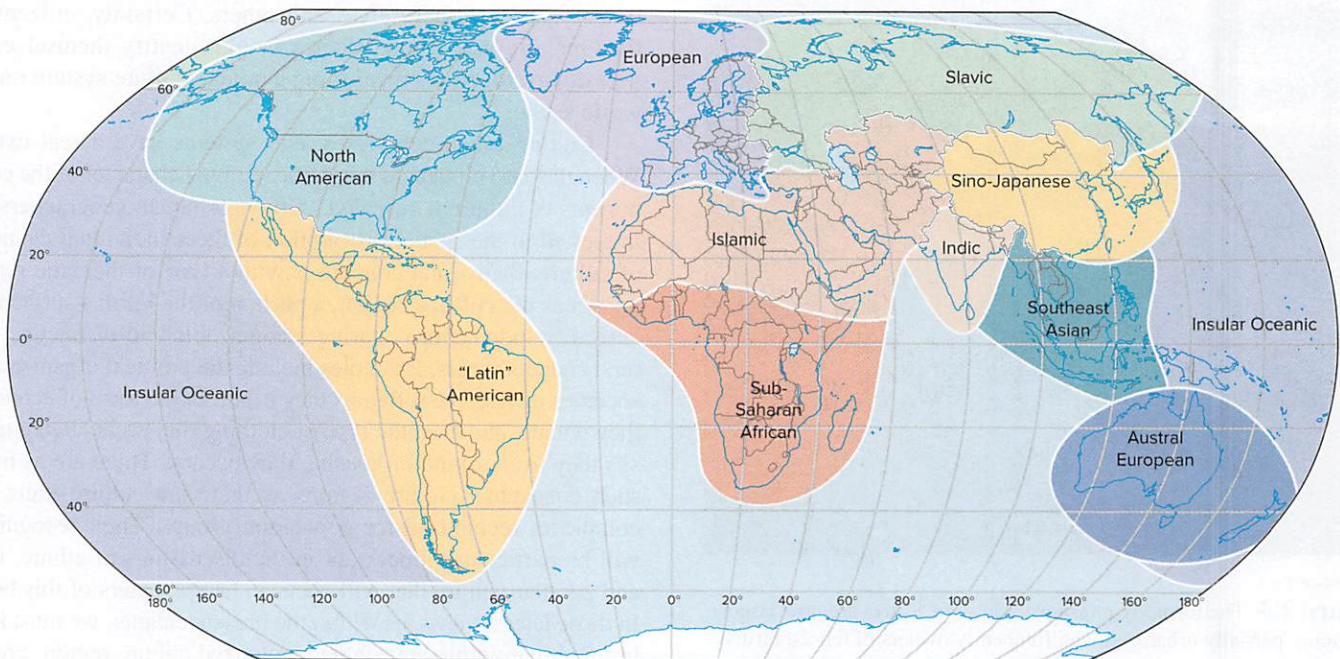


Figure 2.4 Culture realms of the modern world. This is just one of many possible subdivisions of the world into multifactor cultural regions.

Environments as Controls

Geographers have long focused on the role of the physical environment in shaping human culture. However, most geographers today dismiss as intellectually limiting and demonstrably invalid extreme versions of **environmental determinism**, the belief that the physical environment exclusively shapes humans and their cultures. Environmental factors alone cannot account for the cultural variations that occur around the world. Levels of technology, systems of organization, and ideas about what is true and right are not dictated by environmental circumstances.

The environment does place certain limitations on the human use of territory. Such limitations, however, must be seen not as absolute, enduring restrictions but as relative to technologies, cost considerations, national aspirations, and linkages with the larger world. Human choices in the use of landscapes are affected by group perception of the feasibility and desirability of their settlement and exploitation. These are not circumstances inherent in the land. Mines, factories, and cities have been created in the formerly nearly unpopulated tundra and forests of Siberia as a reflection of Russian developmental programs, not in response to recent environmental improvement.

Possibilism is the viewpoint better the original way, as it is now Vidal de la Blache. He argued that the natural environment constrains or limits culture, making some cultural variants more or less possible than others, but it does not strictly determine culture. The needs, traditions, and level of technology of a culture affect how that culture assesses the possibilities of an area and shape what choices the culture makes regarding them. Each society uses natural resources in accordance with its circumstances. Changes in a group's technical abilities or objectives bring about changes in its perceptions of the usefulness of the land. Possibilism is thus a form of environment-culture interactionism.

Unlike some social scientists, however, geographers generally do not accept the extreme opposite of environmental determinism—**cultural autonomy**—that cultures are equally likely to develop any particular set of cultural traits no matter what the environmental circumstances. For example, evidence suggests the nature of some environmental limitations on the use of land area. The vast majority of the world's population is differentially concentrated on less than one-half of the Earth's land surface, as Figure 4.21 indicates. Areas with relatively mild climates and flat topographies that offer a supply of fresh water, fertile soil, and abundant mineral resources are densely settled, reflecting in part the different potentials of the land under earlier technologies to support population. Even today, the polar regions, high and rugged mountains, deserts, and some hot and humid lowland areas contain very few people. If resources for feeding, clothing, or housing ourselves within an area are lacking, or if we do not recognize them there, there is no inducement for people to occupy a territory.

Environments that do contain such recognized resources provide the framework within which a culture operates. Coal, oil, and natural gas have been in their present locations throughout human history, but they were rarely of use to preindustrial cultures and did not impart any understood advantage to their sites of occurrence. Not until the Industrial Revolution did coal deposits gain importance and come to influence the location of such great industrial

complexes as the Midlands in England, the Ruhr in Germany, and the steel-making districts formerly so important in parts of north-eastern United States. Native Americans made one use of the environment around Pittsburgh, while 19th-century industrialists made quite another. The environment influences the chances that a thriving steel industry will develop in one place rather than another, but only when the technological and economic conditions in the culture support steel-making as an activity.

Human Impacts

People are also able to modify their environment, and this is the other half of the human-environment relationship of geographic concern. Geography, including cultural geography, examines both the reactions of people to the physical environment and their impact on that environment. By using our environment, we modify it—in part, through the material objects we place on the landscape: cities, farms, roads, and so on (Figure 2.5). The form these take is the product of the kind of culture group in which we live. The **cultural landscape**, the Earth's surface as modified by human action, is the tangible physical record of a given culture. House types, transportation networks, parks and cemeteries, and the size and distribution of settlements are among the indicators of the use that humans have made of the land.

Human actions, both deliberate and inadvertent, have modified or even destroyed the environment for perhaps as long as human-kind has existed. People have used, altered, and replaced the vegetation in wide areas of the tropics and midlatitudes. They have hunted to extinction vast herds and whole species of animals. They have, through overuse and abuse of the Earth and its resources, rendered sterile and unpopulated formerly productive and attractive regions.

Fire has been called the first great tool of humans, and the impact of its early and continuing use is found on nearly every continent. Poleward of the great rain forests of equatorial South America, Africa, and South Asia lies the *tropical savanna* of extensive grassy vegetation separating scattered trees and forest

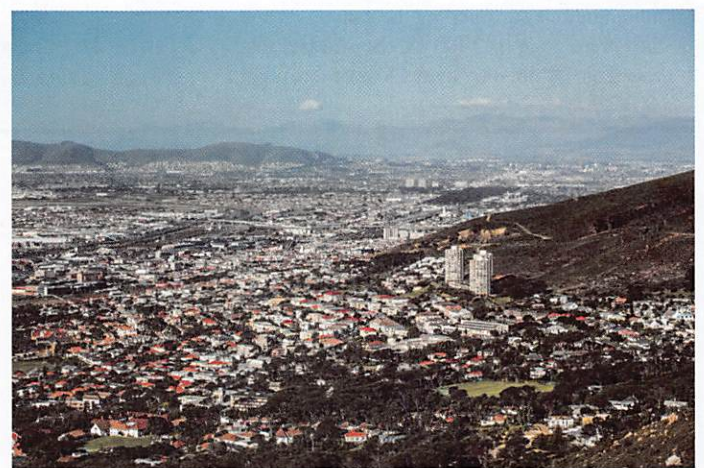


Figure 2.5 The physical and cultural landscapes of Cape Town, South Africa, in juxtaposition. Advanced societies are capable of so altering the circumstances of nature that the cultural landscapes that they create become the main controlling environment.

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Chaco Canyon Desolation

It is not certain when they first came, but by 1000 CE, the Anasazi people were building a flourishing civilization in present-day Arizona and New Mexico. They were corn farmers, thriving during the 300 years or so of the medieval warm period, beginning about 900 CE in the American Southwest. In Chaco Canyon alone, they erected as many as 75 towns, all centered around pueblos, huge stone-and-adobe apartment buildings as tall as five stories and with as many as 800 rooms. These were the largest and tallest buildings of North America prior to the construction of iron-framed “cloudscrapers” in major cities at the end of the 19th century. An elaborate network of roads and irrigation canals connected and supported the pueblos. About 1200 CE, the settlements were abruptly abandoned. The Anasazi, advanced in their skills of agriculture and communal dwelling, were—according to some scholars—forced to move on by the ecological disaster their pressures had brought to a fragile environment.

They needed forests for fuel and for the hundreds of thousands of logs used as beams and bulwarks in their dwellings. The pinyon-juniper woodland of the canyon was quickly depleted. For larger timbers needed for construction, the Anasazi first harvested stands of ponderosa pine found some 40 kilometers (25 miles) away. As early as 1030 CE these, too, were exhausted, and the community switched to spruce and Douglas fir from mountaintops surrounding the canyon. When they were gone by 1200 CE, the Anasazi fate was sealed—not only by the loss of forest but

by the irreversible ecological changes deforestation and agriculture had occasioned. With forest loss came erosion that destroyed the topsoil. The surface water channels that had been built for irrigation were deepened by accelerated erosion, converting them into enlarging arroyos useless for agriculture.

The material roots of their culture destroyed, the Anasazi turned upon themselves;

warfare convulsed the region and, compelling evidence suggests, cannibalism was practiced. Smaller groups sought refuge elsewhere, re-creating on reduced scale their pueblo way of life but now in nearly inaccessible, highly defensible mesa and cliff locations. The destruction they had wrought destroyed the Anasazi in turn.



Figure 2B Chaco Canyon

©Jon Malinowski/Human Landscape Studio

groves (Figure 2.6). The trees appear to be the remnants of naturally occurring tropical dry forests, thorn forests, and scrub now largely obliterated by the use, over many millennia, of fire to remove the unwanted and unproductive trees and to clear off old grasses for more nutritious new growth. The grasses supported the immense herds of grazing animals that were the basis of hunting societies. After independence, the government of Kenya in East Africa sought to protect its national game preserves by prohibiting the periodic use of fire. It quickly found that the immense herds of gazelles, zebras, antelope, and other grazers (and the lions and other predators that fed on them) that tourists came to see were being replaced by less-appealing browsing species—rhinos, hippos, and elephants. With fire prohibited, the forests began to reclaim their natural habitat and the grassland fauna was replaced.

The same form of vegetation replacement occurred in midlatitudes. The grasslands of North America were greatly

extended by Native Americans who burned the forest margin to extend grazing areas and to drive animals in the hunt. The control of fire in modern times has resulted in the advance of the forest once again in formerly grassy areas of Colorado, northern Arizona, and other parts of the U.S. West.

Examples of adverse human impact abound. The *Pleistocene overkill*—the Stone Age loss of whole species of large animals on all inhabited continents—is often ascribed to the unrestricted hunting to extinction carried on by societies familiar with fire who drove animals and used hafted weapons (with handles) to slaughter them. With these methods, according to one estimate, about 40 percent of African large-animal genera passed to extinction. The majority of large mammal, reptile, and flightless bird species had disappeared from Australia around 46,000 years ago; in North America, some two-thirds of original large mammals had succumbed by 11,000 years ago under pressure from the hunters migrating to and



Figure 2.6 The parklike landscape of grasses and trees characteristic of the tropical savanna is seen in this view from Kenya, in Africa.

©Fuse/Getty Images

spreading across the continent. Although some have suggested that climatic changes or pathogens carried by dogs, rats, and other camp followers were at least partially responsible, human action is the more generally accepted explanation for the abrupt faunal changes. No uncertainty exists in the record of faunal destruction by the Maori of New Zealand or of Polynesians who had exterminated some 80 to 90 percent of South Pacific bird species—as many as 2,000 in all—by the time Captain James Cook of Britain arrived in the 18th century. Similar destruction of key marine species—Caribbean sea turtles, sea cows off the coast of Australia, sea otters near Alaska, and others elsewhere—as early as 10,000 years ago resulted in environmental damage whose effects continue to the present.

Not only the destruction of animals but of the life-supporting environment itself has been a frequent consequence of human misuse of areas (see the feature “Chaco Canyon Desolation”). North Africa, the “granary of Rome” during the empire, became wasted and sterile in part because of mismanagement. Roman roads standing high above the surrounding barren wastes give testimony to the erosive power of wind and water when natural vegetation is unwisely removed and farming techniques are inappropriate. Easter Island in the South Pacific was covered lushly with palms and other trees when Polynesians settled there about 400 CE. By the beginning of the 18th century, Easter Island had become the barren wasteland that it remains today. Deforestation increased soil erosion, removed the supply of timbers needed for the vital dugout fishing canoes, and made it impossible to move the massive stone statues that were significant in the islanders’ religion (Figure 2.7). With the loss of livelihood resources and the collapse of religion, warfare broke out and the population was decimated. A similar tragic sequence is occurring on Madagascar in the Indian Ocean today. Despite current romantic notions, early societies did not necessarily live in harmony with their environment.

However, economic and technological developments in culture allow much greater impacts on the natural environment, and in general, the more technologically advanced and complex the culture, the more apparent is its impact on the natural landscape. In sprawling urban-industrial societies, the cultural landscape has come to outweigh the natural physical environment in its impact on most people’s daily lives. It interposes itself between “nature” and humans, and residents of the cities of such societies—living



Figure 2.7 Now treeless, Easter Island once was lushly forested. The statues (some weighing up to 85 tons) dotting the island were rolled to their locations and lifted into place with logs.

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and working in climate-controlled buildings, driving to enclosed shopping malls—can go through life with much less contact with or concern about the physical environment.

2.3 Roots of Culture

Earlier humans found the physical environment more immediate and controlling than we do today. Some 11,000 years ago, the massive glaciers—moving ice sheets of great depth—that had covered much of the land and water of the Northern Hemisphere (Figure 2.8) began to retreat. Animal, plant, and human

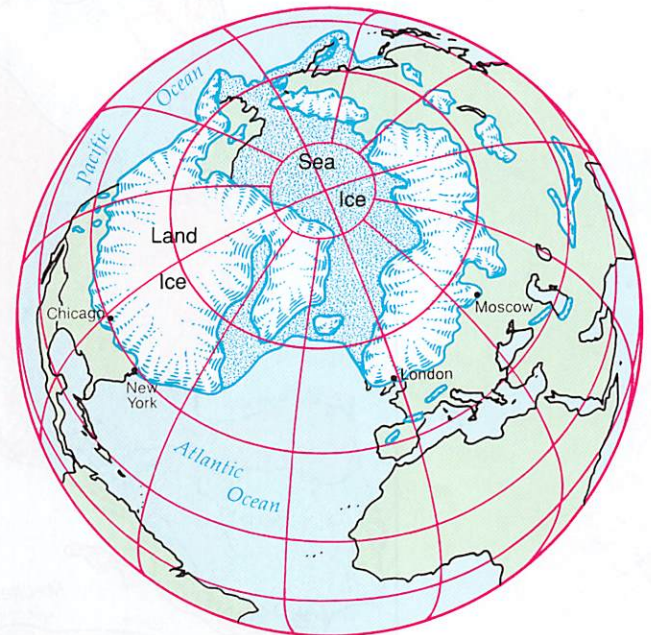


Figure 2.8 Maximum extent of glaciation. In their fullest development, glaciers of the most recent Ice Age covered large parts of Eurasia and North America. Even areas not covered by ice were affected as ocean levels dropped and rose, and climate and vegetation regions changed with glacial advance and retreat.

populations that had been spatially confined by both the ice margin and the harsh climates of middle-latitude regions began to spread, colonizing newly opened territories. The end of the *Paleolithic* (Old Stone Age) is the period near the end of glaciation during which small and scattered groups like the ivory hunters at this chapter's start began to develop regional variations in their ways of life and livelihood.

All were **hunter-gatherers**, preagricultural people dependent on the year-round availability of plant and animal foodstuffs that they could secure with the rudimentary stone tools and weapons at their disposal. Even during the height of the Ice Age, the unglaciated sections of western, central, and northeastern Europe, which today are home to productive farms, forests, and cities, were then covered with tundra vegetation, the mosses, lichens, and low shrubs typical of areas too cold to support forests. Southeastern Europe and southern Russia had forest, tundra, and steppe (grasslands), and the Mediterranean areas,

which today have shrub and scrub-oak vegetation, had forest cover (**Figure 2.9**). Gigantic herds of herbivores—reindeer, bison, mammoth, and horses—browsed, bred, and migrated throughout the tundra and the grasslands. Abundant animal life filled the forests.

Human migration northward into present-day Sweden, Finland, and Russia demanded a much more elaborate set of tools and provision for shelter and clothing than had previously been required. It necessitated the crossing of a number of ecological barriers and the occupation of previously avoided difficult environments. By the end of the Paleolithic period, humans had spread to all the continents but Antarctica, carrying with them their adaptive hunting-gathering cultures and social organizations. The settlement of the lands bordering the Pacific Ocean is suggested in **Figure 2.10**. As they occupied different regions, hunter-gatherers focused on a diversity of foodstuffs. Some specialized in marine or river resources, while others were wholly



Figure 2.9 Late Paleolithic environments of Europe. During the late Paleolithic period, new food-gathering, shelter, and clothing strategies were developed to cope with harsh and changing environments, so different from those in Europe today.

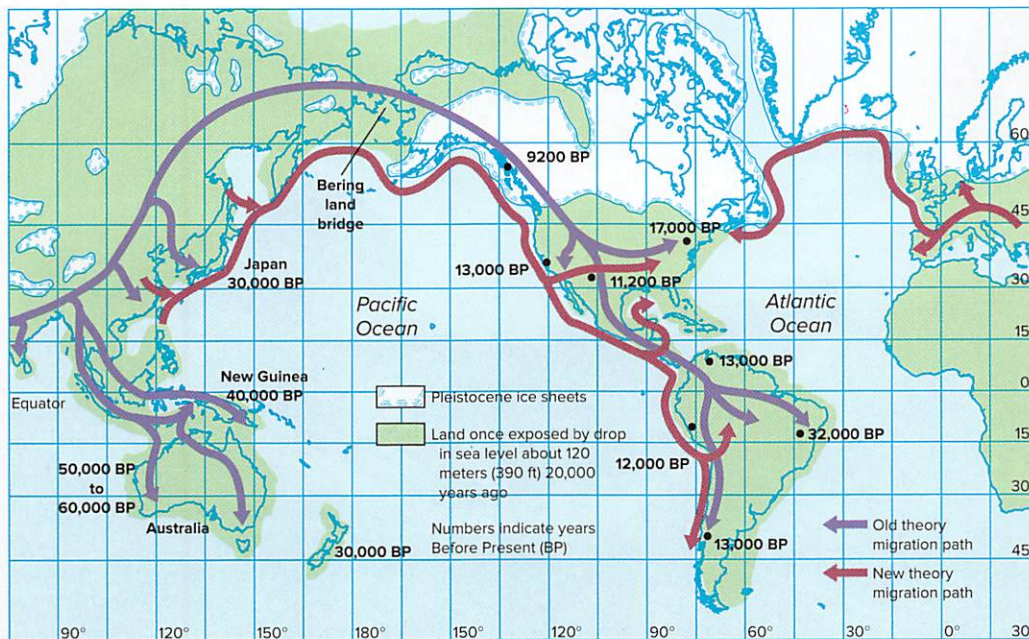


Figure 2.10 Settlement of the Americas and the Pacific basin. Genetic studies suggest humans spread around the globe from their Old World origins beginning some 100,000 years ago. Their time of arrival in the Western Hemisphere, however, is uncertain. The older view claimed that earliest migrants to the Americas, the ancestors of modern Amerindian groups, crossed the Bering land bridge in three different waves beginning 11,500 years ago. Recent evidence suggests that those North Asian land migrants encountered (and conquered or absorbed) earlier occupants who had arrived from Europe, Polynesia, and coastal East Asia by boat traveling along frozen or open shorelines. Although genetic and linguistic research yields mixed conclusions, physical evidence considered solid by some investigators indicates that the first Asian arrivals came at least 22,000 years and more likely 30,000 or more years ago. Eastern United States artifacts that have been assigned dates of 17,000 to 30,000 years ago hint at European arrivals as early as those of coastal Asians; a South Carolina site found in 2004 has been dated at 50,000 years ago. Many researchers, however, caution that any New World population dates earlier than 18,000 years ago are questionable, and that the first migrants from that period probably were most closely related to prehistoric Jomon and later Ainu groups of Japan who crossed over the Bering land bridge.

dependent on land plants and animals. In all cases, their material culture reflected the different climate and vegetation regions they occupied, the tools they developed to exploit the resources on which they depended, and the housing and clothing solutions they differently adopted. Even today, African Bushmen have few cultural similarities with Inuit (Eskimo) hunting-fishing societies, though both culture groups are spoken of as “hunter-gatherers.”

While spreading, the total population also increased. But hunting and foraging bands require considerable territory to support a relatively small number of individuals. There were contacts between groups and, apparently, even planned gatherings for trade, socializing, and selecting mates from outside the home group. Nevertheless, the bands tended to live in isolation. Estimates place the Paleolithic population of the entire island of Great Britain, which was on the northern margin of habitation, at only some 400–500 persons living in widely separated families of 20–40 people. Total world population at about 9000 BCE probably ranged from 5 to 10 million. Variations in the types of tools characteristic of different population groups steadily increased as people migrated and encountered new environmental problems.

Improved tool technology greatly extended the range of possibilities in the use of locally available materials. The result was more efficient and extensive exploitation of the physical environment

than had been possible earlier. At the same time, regional contrasts in plant and animal life and in environmental conditions accelerated the differentiation of culture among isolated groups who under earlier, less varied conditions had shared common characteristics.

Within many environments, even harsh ones, the hunting and foraging process was not particularly demanding of either time or energy. Recent studies of South African San people (Bushmen), for example, indicate that such bands survive well on the equivalent of a 2½-day workweek. Time was available for developing skills in working flint and bone for tools, in developing regionally distinctive art and sculpture, and in making decorative beads and shells for personal adornment and trade. By the end of the Ice Age (about 11,000 to 12,000 years ago), language, religion, long-distance trade, permanent settlements, and social stratification within groups appear to have been well developed in many culture areas.

What was learned and created was transmitted within the cultural group. The increasing variety of adaptive strategies and technologies and the diversity of noneconomic creations in art, religion, language, and custom meant an inevitable cultural variation of humankind. That diversification began to replace the rough social uniformity among hunting and gathering people that had been based on their similar livelihood challenges, informal leadership structures, small-band kinship groups, and the like (Figure 2.11).



Figure 2.11 Hunter-gatherers practiced the most enduring lifestyle in human history, trading it for the sometimes more arduous life of farmers due to the necessity to provide larger quantities of less diversified foodstuffs for a growing population. For hunter-gatherers (unlike their settled farmer rivals and successors), age and sex differences, not caste or economic status, were and are the primary basis for the division of labor and of interpersonal relations. Here, a San (Bushman) hunter of Botswana, Africa, stalks his prey. Men also help collect the gathered food that constitutes 80 percent of the San diet.

©Ben McRae/123RF

2.4 Seeds of Change

The retreat of the last glaciers marked the end of the Paleolithic era and the beginning of successive periods of cultural evolution, leading from basic hunting and gathering economies at the outset through the development of agriculture and animal husbandry to, ultimately, the urbanization and industrialization of modern societies and economies. Because not all cultures passed through all stages at the same time, or even at all, **cultural divergence** between human groups became evident.

Glacial recession brought new ecological conditions to which people had to adapt. The weather became warmer and forests began to appear on the open plains and tundras of Europe and northern China. In the Middle East, where much plant and animal domestication would later occur, savanna (grassland) vegetation replaced more arid landscapes. Populations grew and, through hunting, depleted the large herds of grazing animals already retiring northward with the retreating glacial front.

Further population growth demanded new food bases and production techniques, for the **carrying capacity**—the number of persons supportable within a given area by the technologies at their disposal—of the Earth for hunter-gatherers is low. The *Mesolithic* (Middle Stone Age) period, from about 11,000 to 5000 BCE in Europe, marked the transition from the collection of food to its production. These stages of the Stone Age—occurring during different time spans in different world areas—mark distinctive changes in tools, tasks, and social complexities of the cultures that experienced the transition from “Old” to “Middle” to “New” Stone Age.

Agricultural Origins and Spread

The population of hunter-gatherers rose slowly at the end of the glacial period. As rapid climatic fluctuation adversely affected their established plant and animal food sources, people independently, in more than one world area, experimented with the

domestication of plants and animals. There is no agreement on whether the domestication of animals preceded or followed that of plants. The sequence may well have been different in different areas. What appears certain is that animal domestication—the successful breeding of species to serve human needs—began during the Mesolithic, not as a conscious economic effort by humans but as outgrowths of the keeping of small or young wild animals as pets and the attraction of scavenger animals to the refuse of human settlements. The assignment of religious significance to certain animals and the docility of others to herding by hunters all strengthened the human-animal connections that ultimately led to full domestication. Eventually, nearly everyone in the world would come to obtain their food via agriculture rather than hunting and gathering (see discussion of Innovation below). This had such dramatic effects on the way humans spent their daily lives, as well as the way they interrelated with the natural environment, that it is often referred to as the *Agricultural Revolution*.

Radiocarbon dates suggest the occurrence of the domestication of pigs in southeastern Turkey and of goats in the Near East as early as 8000–8400 BCE, of sheep in Turkey by about 7500 BCE, and of cattle and pigs in both Greece and the Near East about 7000 BCE. North Africa, India, and southeastern Asia were other Old World domestication sources, as were—less successfully—Mesoamerica and the Andean Uplands. Although there is evidence that the concept of animal domestication diffused from limited source regions, once its advantages were learned, numerous additional domestications were accomplished elsewhere. The widespread natural occurrence of species able to be domesticated made that certain. Cattle of different varieties, for example, were domesticated in India, north-central Eurasia, Southeast Asia, and Africa. Pigs and various domestic fowl are other examples.

The domestication of plants, like that of animals, appears to have occurred independently in more than one world region over a time span of between 10,000 and perhaps as long as 20,000 years ago. A strong case can be made that most widespread Eurasian food crops were first cultivated in the Near East beginning some 12,000 years ago, and dispersed rapidly from there across the mid-latitudes of the Old World. However, clear evidence also exists that African peoples were raising crops of wheat, barley, dates, lentils, and chickpeas on the floodplains of the Nile River as early as 18,500 years ago. In other world regions, farming began more recently; the first true farmers in the Americas appeared in Mexico no more than 5,000 years ago.

Familiarity with plants of desirable characteristics is universal among hunter-gatherers. In those societies, females were assigned the primary food-gathering role and thus developed the greatest familiarity with nutritive plants. Their fundamental role in initiating crop production to replace less reliable food gathering seems certain. Indeed, women's major contributions as innovators of technology—in food preparation and clothing production, for example—or as inventors of such useful and important items as baskets and other containers, baby slings, yokes for carrying burdens, and the like are unquestioned.

Agriculture itself, however, may not have been an “invention” as such, but the logical extension to food species of plant selection and nurturing habits developed for nonfood varieties. Plant poisons applied to hunting arrows or spread on lakes or

streams to stun fish made food gathering easier and more certain. Plant dyes and pigments were universally collected or prepared for personal adornment or article decoration. Medicinal and mood-altering plants and derivatives were known, gathered, protected, and cultivated by all early cultures. Indeed, persuasive evidence exists to suggest that early gathering and cultivation of grains was not for grinding and baking as bread but for brewing as beer, a beverage that became so important in some cultures (for religious and nutritional reasons) that it may well have been a first and continuing reason for sedentary agricultural activities.

Nevertheless, full-scale domestication of food plants, like that of animals, can be traced to a limited number of origin areas identified by geographer Carl Sauer and other scientists (Figure 2.12). Although there were several source regions, certain uniformities united them. In each, domestication focused on plant species selected apparently for their capability of providing large quantities of storable calories or protein. In each, there was a population that was already well fed and able to devote time to the selection, propagation, and improvement of plants available from a diversified vegetation. Agricultural innovation would likely have occurred in relatively fertile and productive areas like river valleys and coastal plains. Some speculate, however, that grain domestication in the Near East may have been a forced inventive response, starting some 13,000 years ago, to food shortages reflecting abrupt increases in summertime temperatures and aridity in the Jordan Valley. That environmental stress—reducing summer food supplies and destroying habitats of wild game—favored the selection and cultivation of short-season annual grains and legumes whose seeds could be stored and planted during cooler, wetter winter growing seasons.

In the tropics and humid subtropics, selected plants were apt to be those that reproduced vegetatively—from roots, tubers, or cuttings. Outside of those regions, wild plants reproducing from seeds were more common and the objects of domestication. Although there was some duplication, each of the origin areas developed crop complexes characteristic of itself alone, as Figure 2.12 summarizes. From each, there was dispersion of crop plants to other areas, slowly at first under primitive systems of population movement and communication (Figure 2.13), more rapidly and extensively with the onset of more modern transportation and communication technologies.

While adapting wild plant stock to agricultural purposes, the human cultivators, too, adapted. They assumed sedentary residence to protect the planted areas from animal, insect, and human predators. They developed labor specializations and created more formalized and expansive religious structures in which fertility and harvest rites became important elements. The regional contrasts between hunter-gatherer and sedentary agricultural societies increased. Where the two groups came in contact, farmers were the victors and hunter-gatherers the losers in the competition for territorial control. The contest continued into modern times. During the past 500 years, European expansion totally dominated the hunting and gathering cultures it encountered in large parts of the world such as North America and Australia (see the feature “Is Geography Destiny?”). Even today, in the rain forests of central Africa, Bantu farmers put continuing pressure on hunting and gathering Pygmies,

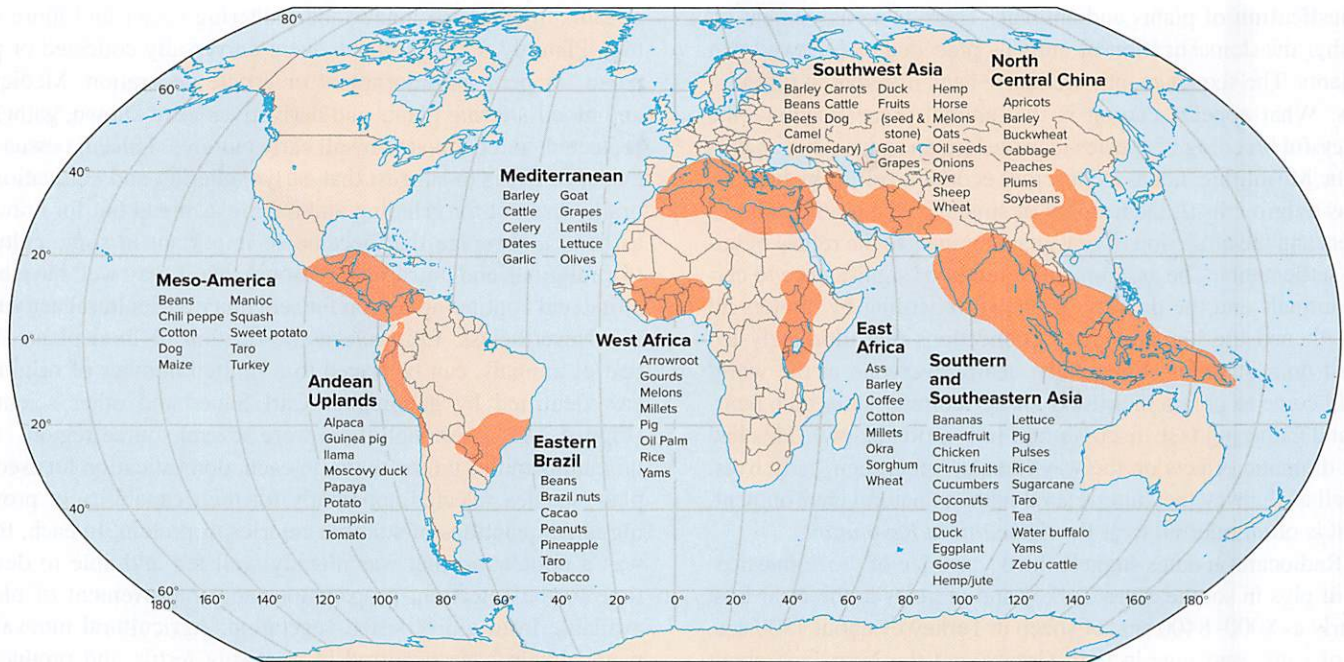


Figure 2.12 Chief centers of plant and animal domestication. The Southern and Southeastern Asia center was characterized by the domestication of plants such as taro, which are propagated by the division and replanting of existing plants (vegetative reproduction). Reproduction by the planting of seeds (e.g., maize and wheat) was more characteristic of Mesoamerica and Southwest Asia. The African and Andean areas developed crops reproduced by both methods. The lists of crops and livestock are selective, not exhaustive.

and in southern Africa, Hottentot herders and Bantu farmers constantly advance on the territories of the San (Bushmen) hunter-gatherer bands. The contrast and conflict between the hunter-gatherers and agriculturalists provide dramatic evidence of cultural divergence.

Neolithic Innovations

The domestication of plants and animals began during the Mesolithic period, but in its refined form it marked the onset of the *Neolithic* (New Stone Age). Like other Stone Age levels, the Neolithic

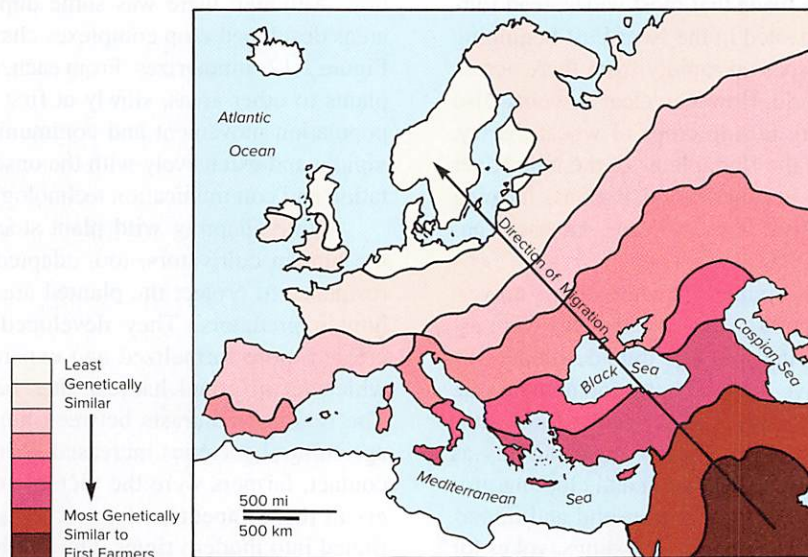


Figure 2.13 The migration of the first farmers out of the Middle East into Europe starting about 10,000 years ago is presumably traced by blood and gene markers. If the gene evidence interpretation is valid, the migrants spread at a rate of about 1 kilometer (five-eighths of a mile) per year, gradually interbreeding with and replacing the indigenous European hunter-gatherers throughout that continent.

Source: Adapted from L. Luca Cavalli-Sforza, Paolo Menozzi, and Alberto Piazza. *The History and Geography of Human Genes*. Princeton, N.J.: Princeton University Press (1994).

Is Geography Destiny?

In his 1997 Pulitzer Prize–winning book *Guns, Germs, and Steel: The Fates of Human Societies*, Jared Diamond argues that “history followed different courses for different peoples because of differences among peoples’ environments, not because of biological differences among peoples themselves.” The environmental differences that counted—and that led to world dominance by Eurasians—were the availability in Eurasia of an abundance of plants and animals suitable for domestication on a landmass whose east-west orientation made easy the long-distance transfer of animals, food crops, and technologies. No other continent had either of those advantages, according to Diamond.

Food production was the key. Although agriculture was independently developed in several world areas after the end of the Ice Age, the inhabitants of the Middle East were fortunate in having an abundance of plants suitable for domestication. These included six of the eight most important food grasses, among them ancestral wheat, plants that adapted easily to cultivation, grew rapidly, and had high nutritive value and high population-supporting potential. Eurasia also

had an abundance of large animals that could be domesticated, including the cow, goat, pig, sheep, and horse, giving a further spur to population growth. In addition, by living in close proximity to animals, Eurasians contracted and developed immunities to the epidemic diseases that would later devastate the inhabitants of other continents when the diseases were brought to their shores by Eurasian explorers and colonizers.

The food-producing technologies developed in such hearth regions as the Middle East were easily diffused along the immense east-west axis of Eurasia, where roughly similar climates suited to the same crop and livestock mix were encountered from China to Spain. In addition, Eurasia’s great size meant it had a great number of different people, each capable of developing new technologies that in turn could be diffused over long distances. Population growth, agricultural productivity, and inventive minds led to civilizations—central governments, cities, labor specializations, textiles, pottery, writing, mathematics, long-distance trade, metal working, and eventually, the guns that conquering Eurasians carried to other continents.

No other world region enjoyed Eurasia’s environmental and subsequent population and technological advantages. The few food crops developed in Africa or the Americas could not effectively diffuse across the climatic and ecological barriers in those north-south aligned continents. Because of accidents of nature or massive predation of large animals by early inhabitants, sub-Saharan Africa and Australia yielded no domesticated animals, and the Americas had only the localized llama. Without the food bases and easy latitudinal movement of Eurasia, populations elsewhere remained smaller, more isolated, and collectively less inventive. When the voyages of discovery and colonization began in the 15th century, Eurasian advantages proved overwhelming. Decimated by diseases against which they had no resistance, without the horses, armor, firearms, or organization of their conquerors, inhabitants of other continents found themselves quickly subdued and dominated—not, in Diamond’s opinion, because of innate inferiority, but because of geographical disadvantages that limited or delayed their developmental prospects.

was more a stage of cultural development than a specific span of time. The term implies the creation of an advanced set of tools and technologies to deal with the conditions and needs encountered by an expanding, sedentary population whose economy was based on the agricultural management of the environment (Figure 2.14).

Not all peoples in all areas of the Earth made the same cultural transition at the same time. In the Near East, from which most of our knowledge of this late prehistoric period comes, the Neolithic lasted from approximately 8000 to 3500 BCE. There, as elsewhere, it brought complex and revolutionary changes in human life. Culture began to alter at an accelerating pace, and change itself became a way of life. In an interconnected adaptive web, technological and social innovations came with a speed and genius surpassing all previous periods.

Humans learned the arts of spinning and weaving plant and animal fibers. They learned to use the potter’s wheel and to fire clay and make utensils. They developed techniques of brick making, mortaring, and construction, and they discovered the skills of mining, smelting, and casting metals. On the foundation of such technical advancements, a more complex exploitative culture

appeared and a more formal economy emerged. A stratified society based on labor and role specialization replaced the rough equality of adults in hunting and gathering economies (various forms of sex-role division of labor largely continued, however). Special local advantages in resources or products promoted the development of long-distance trading connections, which the invention of the sailboat helped to maintain.

By the end of the Neolithic period, certain spatially restricted groups, having created a food-producing rather than a foraging society, undertook the purposeful restructuring of their environment. They began to modify plant and animal species; to manage soil, terrain, water, and mineral resources; and to use animal energy to supplement that of humans. They used metal to make refined tools and superior weapons—first pure copper, and later the alloy of tin and copper that produced the harder, more durable bronze. Humans had moved from adopting and shaping to the art of creating.

As people gathered together in larger communities, new and more formalized rules of conduct and control emerged, especially important where the use of land was involved. We see the beginnings of governments to enforce laws and specify punishments



(a)



(b)

Figure 2.14 (a) The Mediterranean scratch plow, the earliest form of this basic agricultural tool, was essentially an enlarged digging stick dragged by an ass, an ox, or—as here in ancient Palestine—by a ox and a donkey. The scratch plow represented a significant technological breakthrough in human use of tools and animal power in food production. (b) Its earliest evidence is found in Egyptian tomb drawings and in art preserved from the ancient Middle East, but it was elsewhere either independently invented or introduced by those familiar with its use. (See also Figure 2.17a.)

(a) Source: Library of Congress Prints and Photographs Division [LC-DIG-ppmsca-02754]; (b) ©Bojan Brecelj/Corbis Historical/Getty Images

for wrongdoers. The protection of private property, so much greater in amount and variety than that carried by the nomad, demanded more complex legal codes, as did the enforcement of the rules of societies increasingly stratified by social privileges and economic status.

Religions became more formalized. For the hunter, religion could be individualistic, and his worship was concerned with personal health and safety. The collective concerns of farmers were based on the calendar: the cycle of rainfall, the seasons of planting and harvesting, the rise and fall of waters to irrigate the crops, and so on. Religions responsive to those concerns developed rituals appropriate to seasons of planting, irrigation, harvesting, and thanksgiving. An established priesthood was required, one that stood not only as an intermediary between people and the forces of nature, but also as an authenticator of the timing and structure of the needed rituals. In daily life, occupations became increasingly specialized. Metal-workers, potters, sailors, priests, merchants, scribes, and in some areas, warriors complemented the work of farmers and hunters.

2.5 Culture Hearths

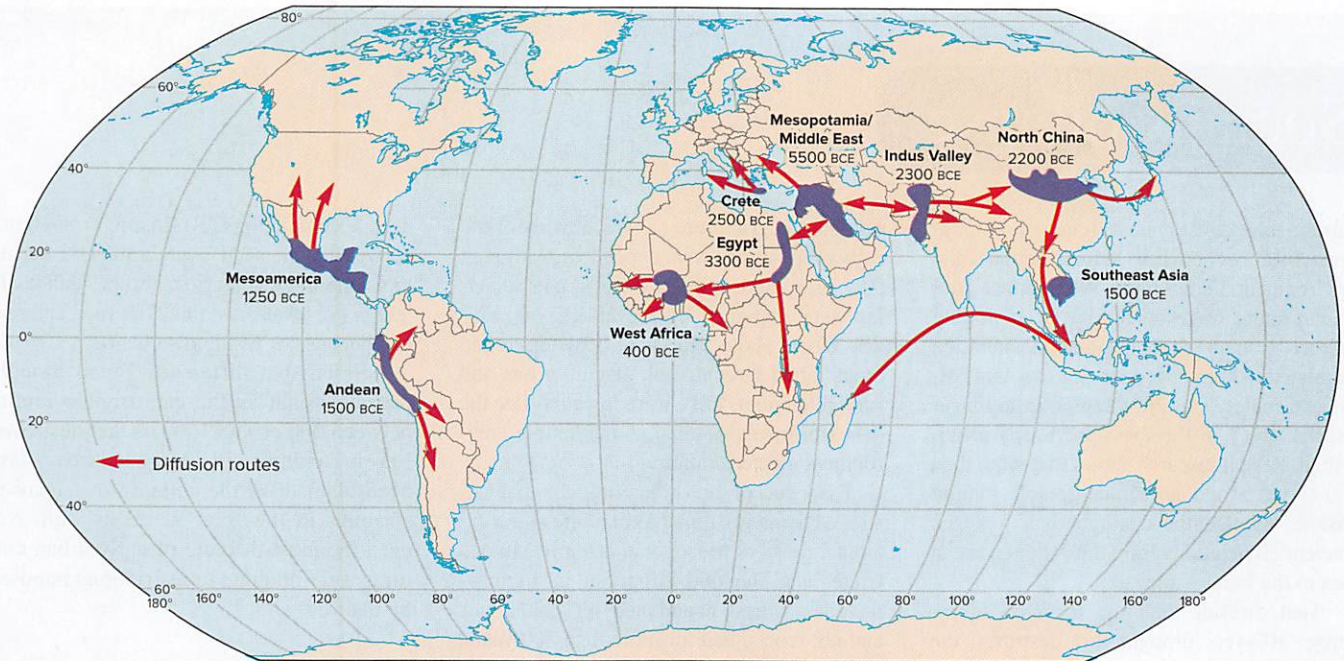
The social and technical revolutions that began in and characterized the Neolithic period were initially spatially confined. The new technologies, the new ways of life, and the new social structures diffused from those points of origin and were selectively adopted by people who were not a party to their creation. The term **culture hearth** is used to describe such centers of innovation and invention, from which clusters of key culture traits and elements moved to exert an influence on surrounding regions.

The hearth may be viewed as the “cradle” of any culture group whose developed systems of livelihood and life created a

distinctive cultural landscape. Most of the hearths that evolved across the world remained at low levels of social and technical development. Only a few developed the trappings of *civilizations*. The definition of that term is not precise, but indicators of its achievement are commonly assumed to be writing, metallurgy, long-distance trade connections, astronomy and mathematics, social stratification and labor specialization, formalized governmental systems, and a structured urban culture.

Several major culture hearths emerged in the Neolithic period. Prominent centers of early creativity were found in Egypt, Crete, Mesopotamia, the Indus Valley of the Indian subcontinent, northern China, southeastern Asia, several locations in sub-Saharan Africa, in the Americas, and elsewhere (Figure 2.15). They arose in widely separated areas of the world, at different times, and under differing ecological circumstances. Each displayed its own unique mix of culture traits.

All major culture hearths were centered around relatively urbanized landscapes, the indisputable mark of civilization first encountered in the Near East 5,500–6,000 years ago, but the urbanization of each was somewhat differently arrived at and expressed (Figure 2.16). In some hearth areas, such as Mesopotamia and Egypt, the transition from settled agricultural village to urban form was gradual and prolonged. In Minoan Crete, urban life was less explicitly developed than in the Indus Valley, where early trade contacts with the Near East suggest the importance of exchange in fostering urban growth (see the feature “Social Collapse”). Trade seems particularly important in the development of West African culture hearths, such as Ghana and Kanem. Coming later (from the 8th to the 10th centuries) than the Nile or Mesopotamian centers, their numerous stone-built towns seem to have been supported both by an extensive agriculture whose origins were probably as early as those of the Middle East and, particularly, by long-distance trade across



AP Figure 2.15 Early culture hearths of the Old World and the Americas. The BCE (Before the Common Era, equivalent to BC) dates approximate times when the hearths developed complex social, intellectual, and technological bases and served as cultural diffusion centers.

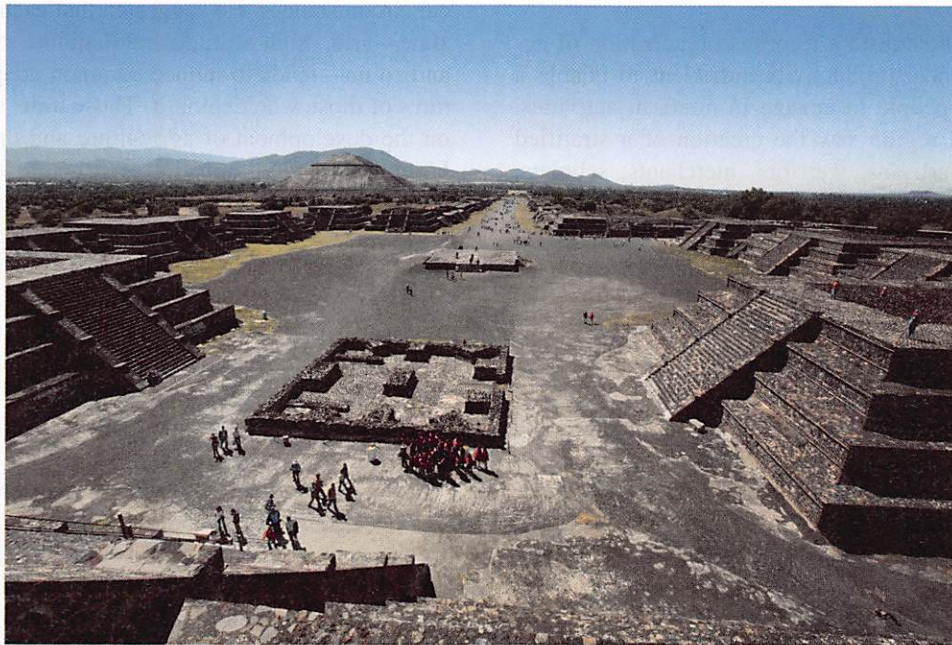


Figure 2.16 Urbanization was invariably a characteristic of culture hearths of both the Old and the New Worlds. Pictured is the Pyramid of the Sun and Avenue of the Dead at Teotihuacán, a city that at its height between 300 CE and 700 CE spread over nearly 18 square kilometers (7 square miles). Located some 50 kilometers (30 miles) northeast of Mexico City in the Valley of Mexico, the planned city of Teotihuacán featured broad, straight avenues and an enormous pyramid complex. The Avenue of the Dead, bordered with low stone-faced buildings, was some 3 kilometers (nearly 2 miles) in length.

©Glow Images

Social Collapse

Sustainable development requires a long-term balance between human actions and environmental conditions. When either poor management of resources by an exploiting culture or natural environmental alteration unrelated to human actions destroys that balance, a society's use of a region is no longer "sustainable" in the form previously established. Recent research shows that more than 4,000 years ago an unmanageable natural disaster spelled the death of half a dozen ancient civilizations from the Mediterranean Sea to the Indus Valley.

That disaster took the form of an intense, 300-year drought that destroyed the

rain-based agriculture on which many of the early civilizations were dependent. Although they prospered through trade, urban societies were sustained by the efforts of farmers. When, about 2200 BCE, fields dried and crops failed through lack of rain, urban and rural inhabitants alike were forced to flee the dust storms and famine of intolerable environmental deterioration.

Evidence of the killer drought that destroyed so many Bronze Age cultures—for example, those of Mesopotamia, early Minoan Crete, and the Old Kingdom in Egypt—includes cities abandoned in 2200 BCE and not reoccupied for more than 300 years;

deep accumulations (20–25 cm, or 8–10 in.) of windblown sand over farmlands during the same three centuries; abrupt declines in lake water levels; and thick lake-bed and seabed deposits of windblown debris.

Similar, but differently timed drought periods—such as the catastrophic aridity between 800 CE and 1000 CE that destroyed Mayan culture in Mesoamerica—have been blamed for the collapse of advanced societies in the New World as well. Not even the most thriving of early urban cultures were immune to restrictions imposed by nature.

the Sahara. The Shang kingdom on the middle course of the Huang He (Yellow River) on the North China Plain had walled cities containing wattle-and-daub buildings but no monumental architecture.

Each culture hearth showed a rigorous organization of agriculture resulting in local productivity sufficient to enable a significant number of people to engage in nonfarm activities. Therefore, each hearth region saw the creation of a stratified society that included artisans, warriors, merchants, scholars, priests, and administrators. Each also developed or adopted astronomy, mathematics, and the all-essential calendar. Each, while advancing in cultural diversity and complexity, exported technologies, skills, and learned behaviors far beyond its own boundaries.

Writing appeared first in Mesopotamia and Egypt at least 5,000 years ago, as cuneiform in the former and as hieroglyphics in the latter. The separate forms of writing have suggested to some that they arose independently, in separate hearths. Others maintain that the idea of writing originated in Mesopotamia and spread outward to Egypt, to the Indus Valley, to Crete, and perhaps even to China, though independent development of Chinese ideographic writing is usually assumed. The systems of record keeping developed in New World hearths were not related to those of the Old, but once created, they spread widely in areas under the influence of Andean and Mesoamerican hearths. In Mesoamerica, distinctive Zapotec, Olmec, and Maya writing systems apparently emerged between 2,600 and 2,300 years ago. Skill in working iron, so important in Near Eastern kingdoms, was an export of sub-Saharan African hearths.

The anthropologist Julian Steward proposed the concept of **multilineal evolution** to explain the common characteristics of widely separated cultures developed under similar ecological circumstances. He suggested that each major environmental zone—arid, high-altitude, midlatitude steppe, tropical forest, and so on—tends to induce common adaptive traits in the cultures of those who exploit it. Those traits were, at base, founded on the development of agriculture and the emergence of similar cultural and administrative structures in the several culture hearths. But *similar* does not imply *identical*. Steward simply suggested that because comparable sequences of developmental events cannot always or even often be explained on the basis of borrowing or exporting of ideas and techniques (because of time and space differences in the cultures sharing them), they must be regarded as evidence of parallel creations based on similar ecologies. From similar origins, but through separate adaptations and independent innovations, distinctive cultures emerged.

In contrast, spatially separated cultures also show similarities because of the spatial spread (diffusion) of cultural traits from common origin sites. In some cases, cultural innovations are passed on along trade routes and through group contact rather than being the result of separate and independent creation. Although the extreme form of this idea, that cultures show similarities primarily—perhaps even solely—because of diffusion from one or only a very few common origin sites (a view known as *diffusionism*) is long out of favor, recent archaeological discoveries apparently document some very long-distance transfer of ideas, technologies, and language by migrating peoples.

In any event, the common characteristics deriving from multilinear evolution and the spread of specific culture traits and complexes contained the roots of **cultural convergence**. That term describes the sharing of technologies, organizational structures, and even cultural traits and artifacts that is so evident among widely separated societies in a modern world united by rapid communication and efficient transportation. Convergence in those worldwide traits is, for many observers, proof of the pervasive globalization of culture.

2.6 The Structure of Culture

Understanding a culture fully is, perhaps, impossible for one who is not part of it (and it is difficult for those inside it, as well). For analytical purposes, however, the traits and complexes of culture—its building blocks and expressions—may be grouped and examined as subsets of the whole. The anthropologist Leslie White suggested that for analytical purposes, a culture could be viewed as a three-part structure composed of subsystems that he termed *ideological*, *technological*, and *sociological*. Specific traits within each subsystem of culture can be labeled *mentifacts*, *artifacts*, or *sociofacts*. Together, according to these interpretations, the subsystems—identified by their separate components—comprise the system of culture as a whole. But we emphasize that this subdivision is for analytical purposes only; in

reality, they are integrated, with each acting on the others and, in turn, affected by them. The **ideological subsystem** consists of ideas, beliefs, and knowledge of a culture and of the ways in which these things are expressed in speech or other forms of communication. Mythologies and theologies, legend, language, literature, philosophy, ethical systems, and folk wisdom make up this category. Passed on from generation to generation, these abstract belief systems, or **mentifacts**, tell us what we ought to believe, what we should value, and how we ought to act. Two basic strands of the ideological subsystem—language and religion—are the subject of Chapter 5.

The **technological subsystem** is composed of the material objects, together with the techniques of their use, by means of which people live. The objects are the tools and other instruments that enable us to feed, clothe, house, defend, transport, and amuse ourselves. We must have food, we must be protected from the elements, and we must be able to defend ourselves. The material objects that we use to fill these needs are **artifacts** (Figure 2.17). In Chapter 10, we will examine the relationship between technological subsystems and regional patterns of economic development.

The **sociological subsystem** of a culture is the sum of those expected and accepted patterns of interpersonal relations and social rituals that find their outlet in economic, political, military, religious, kinship and mating, and other associations. These **sociofacts** define the social organization of a culture. They



(a)



(b)

Figure 2.17 Artifacts are an important component of culture. (a) This Chinese farmer plowing with an ox uses artifacts (tools) typical of the lower technological levels of subsistence agriculture. (b) Cultures with advanced technological subsystems use complex machinery to harness inanimate energy for productive use.

(a) ©The McGraw-Hill Education/Barry Barker, photographer; (b) ©Vevchic/Shutterstock

regulate how the individual functions relative to the group—whether it be family, church, or state. There are no “givens” as far as the patterns of interaction in any of these associations are concerned, except that most cultures possess a variety of formal and informal ways of structuring behavior (Figure 2.18).

Classifications are necessarily arbitrary to some degree, and these classifications of the subsystems and components of culture are no exception. The three-part categorization of subsystems of culture, while helping us to appreciate its structure and complexity, can simultaneously obscure the many-sided nature of individual elements of culture. A dwelling, for example, is an artifact providing shelter for its occupants. It is, simultaneously, a sociofact reflecting the nature of the family or kinship group it is designed to house, and a mentifact summarizing a culture group’s convictions about appropriate design and orientation of dwelling units. In the same vein, clothing serves as an artifact of bodily protection appropriate to climatic conditions, available

materials and techniques, or the activity in which the wearer is engaged. But garments also may be sociofacts, identifying an individual’s role in the social structure of the community or culture, and mentifacts, evoking larger community value systems (Figure 2.19).

Nothing in a culture stands totally alone. Changes in the ideas that a society holds may affect the sociological and technological systems just as changes in technology force adjustments in the social system. The abrupt alteration of the ideological structure of Russia following the 1917 communist revolution from a monarchical, agrarian system to an industrialized, communistic society involved sudden, interrelated alteration of all facets of that country’s culture system. The equally abrupt disintegration of Russian communism in the early 1990s was similarly disruptive of all its established economic, social, and administrative structures. The interlocking nature of all aspects of a culture is termed **cultural integration**.

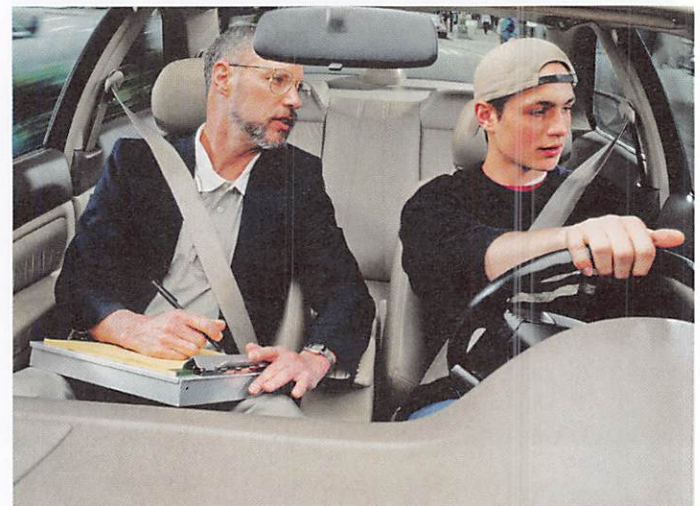


Figure 2.18 All societies prepare their children for membership in the culture group. In each of these settings, certain values, beliefs, skills, and proper ways of acting are being transmitted to the youngsters.

(a) ©Majority World/Universal Images Group/Getty Images; (b) ©Somos Images LLC/Alamy Stock Photo; (c) ©Steve AllenUK/123RF; (d) ©Ryan McVay/Photodisc/Getty Images



(a)



(c)



(b)

Figure 2.19 (a) When clothing serves primarily to cover, protect, or assist in activities, it is an *artifact*. (b) Some garments are *sociofacts*, identifying a role or position within the social structure: the distinctive “uniforms” of the soldier, the cleric, or the beribboned ambassador immediately proclaim their respective roles in a culture’s social organizations. (c) The hijabs worn by many Muslim women are *mentifacts*, indicative not specifically of the fashion preferences of the wearer but of the values of the wearer’s culture.

(a) ©Sanchai Rattakunchorn/123RF; (b) ©Rob Melnychuk/Stockbyte/Getty Images; (c) ©Grigvovan/Shutterstock

2.7 Culture Change

The recurring theme of cultural geography is change. No culture is, or has been, characterized by a permanently fixed set of material objects, systems of organization, or even ideologies. Admittedly, all of these may be long enduring within a stable, isolated society at equilibrium with its resource base. Such isolation and stability have always been rare. On the whole, while cultures are essentially conservative, they are always in a state of flux. Some changes are major and pervasive. The transition from hunter-gatherer to sedentary farmer, as we have seen, affected markedly every facet of the cultures experiencing that change and the experiences of the people living in those cultures. Profound, too, was the impact of the Industrial Revolution and its associated urbanization on all the societies that it has touched.

Not all change is so extensive as that following the introduction of agriculture or mechanized manufacturing. Many changes are so slight individually as to go almost unnoticed at their inception, though cumulatively they may substantially alter the affected culture. Think of how the culture of the United States differs today from what you know it to have been in 1940—not in essentials, perhaps, but in the innumerable electrical, digital, and transportation devices that have been introduced and in the social, behavioral, and recreational changes they and other technological changes have wrought. Among these latter have been shifts in employment patterns to include greater participation by women in the waged workforce and associated adjustments in attitudes toward the role of women in the society at large. Such cumulative changes occur because the cultural traits of any group are not independent; they are clustered in a coherent and integrated pattern. Change on a small scale can have wide repercussions as associated traits accommodate to the adopted adjustment. Change, both major and minor, within cultures is induced by *innovation*, *diffusion*, and *acculturation*.

Innovation

Innovation implies changes to a culture that result from ideas created within the social group itself and adopted by the culture. The novelty may be an invented improvement in material technology, like the bow and arrow or the jet engine. It may involve the development of nonmaterial forms of social structure and interaction: feudalism, for example, or Christianity. It may be a new form of popular music or a new way of styling hair.

Many innovations are of little consequence by themselves, but sometimes the widespread adoption of seemingly inconsequential innovations may bring about large changes when viewed over a period of time. A new musical style such as hip-hop “adopted” by a few people may spread to others and bring with it changes to vernacular speech, clothing styles, dance styles, graffiti art, and other forms of entertainment, which, in turn, may affect retailers’ advertising campaigns and consumers’ spending. Eventually, a new cultural form will be identified that may have an important impact on the thinking processes of the adopters and on those who come into contact with the adopters. Notice that a broad definition of innovation is used, but notice also that what is important is whether or not innovations are accepted and adopted.

Premodern and traditional societies characteristically are not very innovative. In societies at equilibrium with their environment and with no unmet needs, change has no obvious or immediate adaptive value and little reason to occur. Indeed, all societies have an innate resistance to change because innovation inevitably creates tensions between the new reality and other established socioeconomic conditions. Those tensions can be resolved only by adaptive changes elsewhere in the total system. The gap that may develop between, for example, a newly adopted technology and other, slower-paced social traits has been called *cultural lag*. Complaints about youthful fads or the glorification of times past are familiar examples of reluctance to accept or adjust to change.

Innovation and invention—frequently under stressful conditions—have marked the history of humankind. As we have seen, growing populations at the end of the Ice Age necessitated an expanded food base. In response, domestication of plants and animals appears to have occurred independently in more than one world area. Indeed, a most striking fact about early agriculture is the near universality of its development or adoption within a very short span of human history. In 10,000 BCE, the world population of no more than 10 million was nearly exclusively hunter-gatherers. By 1500 CE, only 1 percent of the world’s 350 million people still followed that way of life. Today, much less than 1 percent of the world’s 7 billion people do. The revolution in food production represented by the advent of agriculture affected every facet of the threefold subsystems of culture of every society accepting it. All innovation has a radiating impact on the web of culture; the more basic the innovation, the more pervasive its consequences.

In most modern societies, innovative change has become common, expected, and inevitable. The rate of invention, at least as measured by the number of patents granted, has steadily increased, and the period between idea conception and product availability has been decreasing. A general axiom is that the more

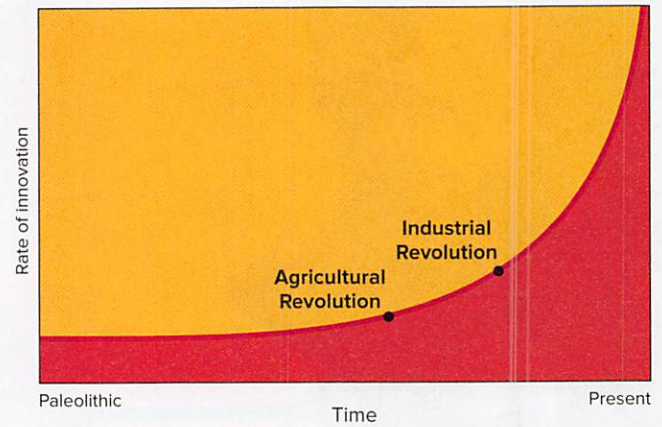


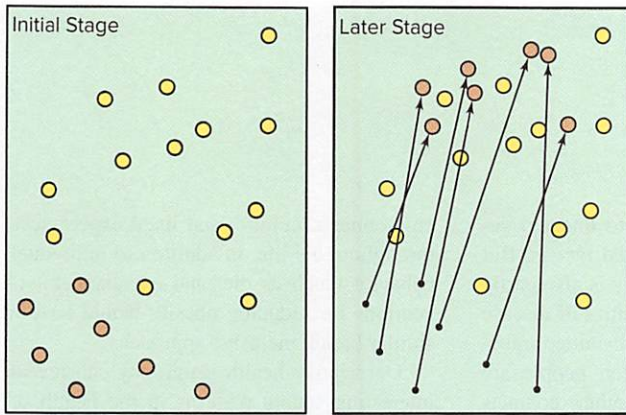
Figure 2.20 The trend of innovation through human history. Hunter-gatherers, living in equilibrium with their environment and their resource base during the Paleolithic period, had little need for innovation and no necessity for cultural change. The Agricultural Revolution accelerated the diffusion of the ideas and techniques of domestication, urbanization, and trade. With the Industrial Revolution, dramatic increases in all aspects of socioeconomic innovation began to alter cultures throughout the world.

ideas available and the more minds able to exploit and combine them, the greater the rate of innovation. The spatial implication is that larger urban centers of advanced technologies tend to be centers of innovation. This is not just because of their size but because of the opportunities they provide for the exchange of ideas. Indeed, ideas not only stimulate new thoughts and viewpoints but also create circumstances in which societies come to develop new solutions increasingly as a cultural practice in itself (**Figure 2.20**).

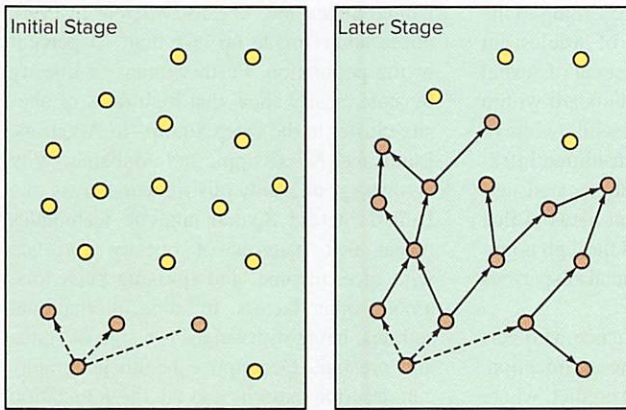
Diffusion

Diffusion is the process by which an idea or innovation is transmitted from one individual or group to another across space. Diffusion may assume a variety of forms, each different in its impact on social groups. Basically, however, two processes are involved: (1) People move, for any of a number of reasons, to a new area and take their culture with them. For example, immigrants to the American colonies brought with them crops and farming techniques, building styles, and concepts of government that were alien to their new home. (2) Information about an innovation (e.g., hybrid corn or compact discs) may spread throughout a society, perhaps aided by local or mass media advertising; or new adopters of an ideology or way of life—for example, a new religious creed—may be inspired or recruited by immigrant or native converts. The former is known as *relocation diffusion*, the latter as *expansion diffusion* (**Figure 2.21**).

Expansion diffusion involves the spread of a culture trait from one place to others when people who did not formerly practice the trait adopt it after direct or indirect contact with those who do practice the trait. In the process, the thing diffused also remains—and is frequently intensified—in the origin area. Islam, for example, expanded from its Arabian Peninsula origin locale across much of Asia and North Africa.



(a) RELOCATION DIFFUSION



(b) EXPANSION DIFFUSION

- Non-Adopter
- Adopter of innovation

AP **Figure 2.21** Processes of diffusion. (a) In *relocation diffusion*, innovations or ideas are transported to new areas by carriers who permanently leave the home locale. (b) In *expansion diffusion*, a phenomenon spreads from one place to another, but in the process remains and is often intensified in the place of origin.

Source: Redrawn from *Spatial Diffusion*, by Peter R. Gould, Resource Paper no. 4, page 4, Association of American Geographers, 1969.

At the same time, it strengthened its hold over its Near Eastern birthplace by displacing practitioners of tribal, Christian, and Jewish religions. The term *expansion* refers to the fact that this process of diffusion necessarily involves an increase in the number of people or societies practicing the trait. Furthermore, as potential adopters become adopters and serve to pass on the innovation to others, the number of contacts of adopters with potential adopters will compound. Consequently, the innovation will spread slowly at first and then more and more rapidly until saturation occurs or a barrier is reached. The incidence of adoption under expansion diffusion is represented by the S-shaped curve in **Figure 2.22**.

When adoption of an innovation spreads from an area where it is practiced to a neighboring area, reflecting *distance decay* (Chapter 3), it is termed **contagious diffusion**. This pattern of

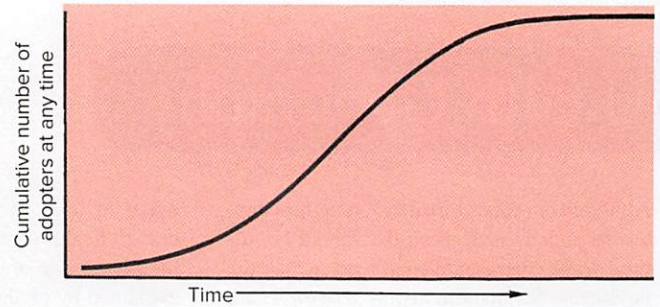
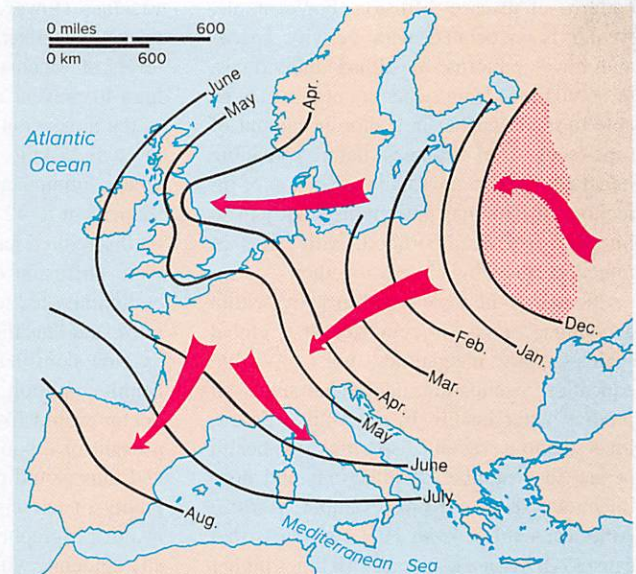


Figure 2.22 The diffusion of innovations over time. The number of adopters of an innovation rises at an increasing rate until the point at which about one-half of the total who ultimately decide to adopt the innovation have made the decision. At that point, the number of adopters increases at a decreasing rate.

diffusion reflects the importance of direct contact between those who developed or have adopted the innovation and those who newly encounter it, and is reminiscent of the course of infectious diseases (**Figure 2.23**); in fact, some geographers apply the concept of diffusion to the study of spatial patterns of disease (see the feature “**Health Geography**”). Contagious diffusion results in the continuous spread of innovations, like “waves.” In some instances, however, geographic distance is less important in the transfer of ideas than is communication between major centers or important people. News of new clothing styles, for



AP **Figure 2.23** The pattern of contagious diffusion is sensitive to both time and distance, as suggested by the diffusion pathways of the European influenza pandemic of 1781. The pattern there was a wave-like radiation from a Russian origin area.

Source: Based on Gerald F. Pyle and K. David Patterson, *Ecology of Disease 2*, no. 3 (1984): 179.

Health Geography

Although our focus on diffusion in this chapter has mostly concerned the spread of cultural traits, diseases also spread across the landscape. Scholars in *health geography* are interested in the spatial patterns of diseases. Health geographers incorporate theories and methods from a number of different disciplines in addition to geography, including epidemiology and other social sciences, in order to examine health-related topics. They look beyond individual-level behaviors to study how social and physical environments (i.e., contextual factors), and individual's interactions with one another and the environment (i.e., social epidemiology), influence the health of populations and the spread of disease.

Consider an infectious disease, or a disease that can be transmitted from one person to another by some type of contact. Often these diseases spread over space and time following the rules of spatial diffusion, such as distance decay and hierarchies of nodes. Health geographers additionally consider how individuals and groups have different patterns of movement and types of contacts, which may result in unique but predictable patterns of disease diffusion. For example, wealth is associated with activity spaces and travel patterns. Wealthier individuals, or populations from richer countries, may be able to travel farther in a shorter amount of time (such as on airplanes) before spreading infection. On the other hand, diffusion of infectious disease may present differently in an impoverished neighborhood, with cases of infection clustering closely together.

No matter the scale—within a city, within a country, or across countries at a global scale—health inequalities exist. Wealth, education, occupation, and social status all predict better health. In the United States, long-standing racial disparities in health persist in a number of infectious and non-infectious diseases. For example, African Americans suffer from HIV (the virus that causes AIDS) at a rate nearly 10 times higher than their non-Hispanic white counterparts. The root of this disparity is still unknown

but is at least partially due to unequal access to health care, stigma, and racism. But the persistence of the disparity is also partly explained by predictable qualities of disease diffusion. Within sexually transmitted infections, sexual contacts between people are not randomly determined. Rather, contacts are structured based on race/ethnicity and age—people have sexual contact with others that are similar to them. According to the National Longitudinal Study of Adolescent to Adult Health, around 90 percent of sexual partnerships among young adults are within the same racial category (e.g., white/white or black/black), and sexually transmitted infections circulate within these segregated networks. This results in a contact network that dictates how infections spread through populations and partly sustains racial disparities in HIV.

Social processes also influence who gets infected after being exposed to an infection. Patterns of vaccination can predict where clusters of infection may or may not appear. In many resource-poor settings, higher levels of vaccine-preventable diseases, such as measles, are due to inadequate coverage of vaccines. However, even in the United States, pockets of infection appear in places where levels of vaccination were once sufficiently high to prevent an epidemic. Recently, one of the largest outbreaks of measles occurred in a tight-knit community in Minnesota where immunization rates plummeted from 92 percent to 42 percent over 5 years based on discredited fears that vaccines trigger autism. Diffusion of fear and mistrust in the community led to the decline in vaccination rates, and thus the measles outbreak.

Now consider a noninfectious disease or health condition, such as obesity. A medical doctor would likely claim that obesity was a result of a poor diet and lack of exercise, and thus would prescribe a healthy diet and plenty of exercise to treat the problem. A health geographer would approach the obesity epidemic with a broader lens. She would consider how and why obesity could be associated with a persons' natural and social

environment, culture, and lived experiences throughout his life, in addition to individual behavior (such as diet and exercise); interventions for reducing obesity would have a similar broad, inclusive approach.

Descriptive health geography can reveal interesting spatial patterns in the health of populations over space and time. More than one-third (36.5 percent) of adults in the United States have obesity, whereas in 1990, obese adults made up less than 15 percent of the population. Further, maps of obesity by state clearly show that high rates of obesity cluster in the Deep South—in Arkansas, Louisiana, Mississippi, and Alabama. Why is obesity unevenly distributed across the United States? Spatial analytic techniques reveal that patterns of obesity correlate with race, income, and smoking behaviors, among other factors. In some international settings, being overweight is a sign of status and prestige. Descriptive health geography can describe patterns and lay the foundation for further scientific study.

Physical space and the built environment clearly affect the health of populations, from exposure to air pollution to the ability to walk safely in a neighborhood. Health geographers examine nutritional environments to assess whether access to affordable, healthy food influences diet and rates of obesity. Interestingly, the results of research on this have been mixed. Some research has found a link between the density of healthy food options and a healthier diet. On the other hand, a study in Glasgow showed that when a large supermarket opened in a poor neighborhood that had previously lacked one, local residents did not begin to shop there—they perceived that the market was not designed for them. Links between the physical environment and health can be straightforward, or can be more complex and depend on other concepts of culture, tradition, diffusion of knowledge, and history.

By Susan Cassels, University of California, Santa Barbara.
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example, quickly spreads internationally among major cities and only later filters down irregularly to smaller towns and rural areas. The pattern of transferring ideas first between larger places or prominent people and only later to smaller or less important points or people is known as **hierarchical diffusion**. The Christian faith in Europe, for example, spread from Rome as the principal center to provincial capitals and thence to smaller Roman settlements in largely pagan-occupied territories (see Figure 5.21). Today, new discoveries are shared among scientists at leading universities before they appear in textbooks or become general knowledge through the public press. The hierarchical pattern takes place because, in many cases, distance is largely overcome by communication networks; this implies contact through indirect means, such as the Internet or mass media. Big cities or leading scientists, connected by strong information flows, are “closer” than their simple distance separation suggests. Hierarchical diffusion results in patterns of innovation “jumping” over space, and often results in the formation of new clusters of the trait.

While the diffusion of ideas may be slowed by the need to overcome distance, their speed of spread may be increased to the point of becoming almost instantaneous through the *space-time compression* made possible by modern communication. Given access to radios; telephones; worldwide transmission of television news, sports, and entertainment programs; and—perhaps most importantly—to computers and the Internet, people and areas distantly separated can rapidly share in a common fund of thought and innovation. Modern communication technology, that is, has encouraged and facilitated the globalization of culture.

In contrast to expansion diffusion, **relocation diffusion** occurs when the innovation is carried to new areas by migrating individuals or populations that possess it (Figure 2.21a); in Chapter 3, we learn that migration is also known by geographers as *residential relocation*. Mentifacts, sociofacts, or artifacts are therefore introduced into new locales by new settlers who become part of populations not themselves associated or in contact with the origin area of the innovation. The spread of religions by settlers or conquerors is a clear example of relocation diffusion, as was the diffusion of agriculture to Europe from the Middle East (Figure 2.13). Christian Europeans brought their faiths to areas of colonization or economic penetration throughout the world. At the world scale, massive relocation diffusion resulted from the European colonization and economic penetration that began in the 16th century. More localized relocation diffusion continues today as Asian refugees or foreign “guest workers” bring their cultural traits to their new areas of settlement in Europe or North America. Like expansion diffusion, relocation diffusion spreads cultural traits across the landscape, but unlike it, relocation diffusion does not entail an increase in the number of people or societies practicing the trait. Also, because migration often reflects patterns of distance decay, wherein people move over short distances, or it reflects patterns of long-distance relocation over transportation networks like highways or airline routes, relocation diffusion can also be characterized as reflecting patterns of contagious or hierarchical diffusion.

For either expansion or relocation diffusion, innovations may be relatively readily diffused to, and accepted by, cultures that have basic similarities and compatibilities. Continental Europe and North America, for example, could easily and quickly adopt the innovations of the Industrial Revolution diffused from England with which they shared a common ethnic, economic, and technological background. Industrialization was not quickly accepted in Asian and African societies of totally different cultural conditioning. On the ideological level, too, successful diffusion depends on acceptability of the innovations. The attempt by Mohammed Reza Pahlavi, the shah of Iran, at rapid westernization of traditional Iranian Islamic culture after World War II provoked a traditionalist backlash and revolution that deposed him and reestablished clerical control of the state in 1979.

The conclusion must be, therefore, that diffusion cannot be viewed solely as the outcome of contact and knowledge dispersal. The acceptance of new traits, artifacts, or ways of doing or thinking by a potential receiving population depends not just on information flow to that population but also upon its entire cultural and economic structure. Innovation may be rejected not because of lack of knowledge but because the new trait violates the established cultural norms of the culture to which it is introduced. For example, cash crop specialization recommended to a peasant agricultural society may be rejected not because it is not understood, but because it unacceptably disrupts the knowledge base and culture complex devoted to assured food security in a subsistence farming economy. Similarly, less disruptive new production ideas—chemical fertilizers, deep-well irrigation, hybrid seeds, and the like—may be rejected simply because, though understood, they are not affordable. Culture is a complex organized system and culture change involves alteration of the system’s established structure in ways that may be rejected even after knowledge of an innovation is received and understood.

It is not always possible, of course, to determine the precise point of origin or the routes of diffusion of innovations now widely adopted (see the feature “Documenting Diffusion”). Nor is it always certain whether the existence of a cultural trait in two different areas is the result of diffusion or of **independent (or parallel) invention**. Cultural similarities do not necessarily prove that diffusion has occurred. The pyramids of Egypt and of the Central American Maya civilization most likely were separately conceived and are not necessarily evidence, as some have proposed, of pre-Columbian voyages from the Mediterranean to the Americas (or of visits by aliens from outer space, as has also been suggested). A Neolithic monument-building culture, after all, has only a limited number of shapes from which to choose.

Historical examples of independent, parallel invention are numerous: logarithms by John Napier (1614) and Jost Bürgi (1620), the calculus by Isaac Newton (1672) and Gottfried Leibniz (1675), and the telephone by Elisha Gray and Alexander Graham Bell (1876) are commonly cited. It appears beyond doubt that agriculture was independently developed not only in both the New World and the Old, but also in more than one culture hearth in each of the hemispheres.

Documenting Diffusion

The places of origin of many ideas, items, and technologies important in contemporary cultures are only dimly known or supposed, and their routes of diffusion are speculative at best. Gunpowder and printing are presumed to be the products of Chinese inventiveness; the lateen sail has been traced to the Near Eastern culture world. The moldboard plow is ascribed to 6th-century Slavs of northeastern Europe. The sequence and routes of the diffusion of these innovations has not been documented.

In other cases, such documentation exists, and the process of diffusion is open to analysis. Clearly marked is the diffusion path of the custom of smoking tobacco, a practice that originated among Amerindians. Sir Walter Raleigh's Virginia colonists, returning home in 1586, introduced smoking to English court circles, and the habit very quickly spread among the general populace. England became the source region of the new custom for northern Europe; smoking was introduced to Holland by English medical students in 1590. The Dutch and English together spread the habit by sea to the Baltic and Scandinavian areas and overland through Germany to Russia. The innovation continued its eastward diffusion, and within a hundred years, tobacco had spread across Siberia and was, in the 1740s, reintroduced to the American continent at Alaska by Russian fur traders. A second route of diffusion for tobacco

smoking can be traced from Spain, where the custom was introduced in 1558, and from which it spread more slowly through the Mediterranean area into Africa, the Near East, and Southeast Asia.

In more recent times, hybrid corn was first adopted by imaginative farmers of northern Illinois and eastern Iowa in the mid-1930s. By the late 1930s and early 1940s, the new seeds were being planted as far east as Ohio and north to Minnesota, Wisconsin, and northern Michigan. By the late 1940s, all commercial corn-growing districts of the

United States and southern Canada were cultivating hybrid corn varieties.

A similar pattern of diffusion marked the expansion of the Wal-Mart store chain. From its origin in northwest Arkansas in 1962, the discount chain had spread throughout the United States by the 1990s to become the country's largest retailer in sales volume (Figure 2C). In its expansion, Wal-Mart displayed a "reverse hierarchical" diffusion, initially spreading by being price-competitive with small-town merchants before opening its first stores in larger cities and metropolitan areas.

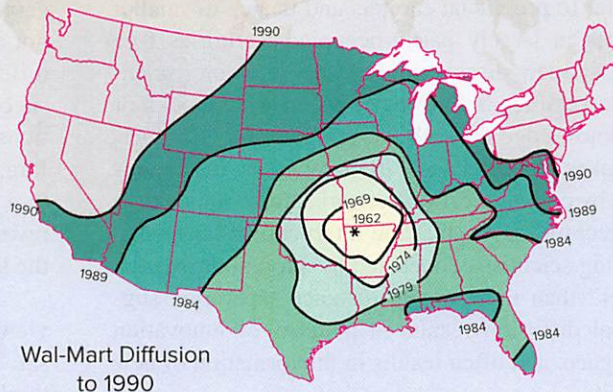


Figure 2C

Source: Map based on data from Thomas O. Graff and Dub Ashton, "Spatial Diffusion of Wal-Mart: Contagious and Reverse Hierarchical Elements." *Professional Geographer* 46, 1 (1994): 19–29.

Acculturation and Cultural Modification

A culture group may undergo major modifications in its own identifying traits by adopting some or all of the characteristics of another, dominant culture group. Such is the case in **acculturation**—discussed at greater length in Chapter 6 (Section 6.3)—as immigrant populations take on the values, attitudes, customs, and speech of the receiving society, which itself undergoes change from absorption of the arriving group. A different form of contact and subsequent cultural alteration may occur in a conquered or colonized region where the subordinate or subject population is either forced to adopt the culture of the new ruling group, introduced through relocation diffusion, or does so voluntarily, overwhelmed by the superiority in numbers or

the technical level of the conqueror. Tribal Europeans in areas of Roman conquest, native populations in the wake of Slavic occupation of Siberia, and Native Americans stripped of their lands following European settlement of North America experienced this kind of cultural modification or adoption.

In extreme cases, of course, small and, particularly, primitive indigenous groups brought into contact with conquering or absorbing societies may simply cease to exist as separate cultural entities. Although presumably such cultural loss has been part of all of human history, its increasing occurrence has been noted over the past 500 years. By one informed estimate, at least one-third of the world's inventory of human cultures has totally disappeared since 1500 CE, along with their languages, traditions, ways of life, and, indeed, their very identity and memory of their existence.

In many instances, close contact between two different groups may involve adjustments of the original cultural patterns of both rather than disappearance of either. For example, changes in Japanese political organization and philosophy were imposed by occupying Americans after World War II, and the Japanese voluntarily adopted some of the more frivolous aspects of American life (Figure 2.24). In turn, American society was enriched by the selective importation of Japanese cuisine, architecture, and philosophy, demonstrating the two-way nature of cultural diffusion. Where that two-way flow reflects a more equal exchange of cultural outlooks and ways of life, a process of *transculturation* has occurred. That process is observable within the United States as massive South and Central American immigration begins to intertwine formerly contrasting cultures, altering both.

2.8 Contact Between Regions

Virtually all cultures are amalgams of innumerable innovations spread spatially from their points of origin and integrated into the structure of the receiving societies. It has been estimated

that no more than 10 percent of the cultural items of any society are traceable to innovations created by its members and that the other 90 percent come to the society through diffusion (see the feature “A Homemade Culture”). Because, as we have seen, the pace of innovation is affected strongly by the mixing of ideas among alert, responsive people and is increased by exposure to a variety of cultures, the most active and innovative historical hearths of culture were those at crossroad locations and those deeply involved in distant trade and colonization. Ancient Mesopotamia and classical Greece and Rome had such locations and involvements, as did the West African culture hearth after the 5th century and, much later, England during the Industrial Revolution and the spread of the British Empire.

Recent changes in technology permit us to travel farther than ever before, with greater safety and speed, and to communicate without physical contact more easily and completely than was previously possible. This intensification of contact has resulted in an acceleration of innovation and in the rapid spread of goods and ideas. Several millennia ago, innovations such as smelting of metals took hundreds of years to diffuse. Today, worldwide



Figure 2.24 Baseball, an import from America, is one of the most popular sports in Japan, attracting millions of spectators annually.

©Kyodo News/Getty Images

diffusion—through Internet interest groups, for example—may be almost instantaneous.

Obstacles do exist, of course. *Diffusion barriers* are any conditions that hinder either the flow of information or the movement of people and thus retard or prevent the acceptance of an innovation. Because of the *friction of distance*, generally the farther two areas are from each other, the less likely is interaction to occur, an observation earlier (Section 2.7) summarized by the term *distance decay*. Distance and barriers as factors in spatial interaction are further explored in Chapter 3. For now, it is sufficient to note that distance may be an *absorbing barrier*, halting the spread of an innovation.

Political restrictions, religious taboos, and other social customs are cultural barriers to diffusion. The French Canadians, although close geographically to many Anglo-Canadian centers of diffusion such as Ottawa and Toronto, strive to be only minimally influenced by them. Both their language and culture complex govern their selective acceptance of Anglo influences, and restrictive French-only language regulations are enforced to preserve the integrity of their distinctive French culture. In a more extreme fashion, the Afghan Taliban and other Mideast fundamentalist groups adamantly or violently reject Western sociocultural values, seeking to preserve their religious and cultural purity through isolation from secular,

non-Islamic influences. Traditional groups, perhaps controlled by firm religious conviction, may largely reject culture traits and technologies of the larger society in whose midst they live (see Figure 7.2 in Chapter 7).

Adopting cultures do not usually accept items intact that originate outside the receiving society. Diffused ideas and artifacts commonly undergo some alteration of meaning or form that makes them acceptable to a borrowing group. The process of the fusion of the old and new is called **syncretism** and is a major feature of culture change. It can be seen in alterations to religious ritual and dogma made by convert societies seeking acceptable conformity between old and new beliefs. For example, enslaved people brought voodoo from West Africa to the Americas where it thrived in Haiti and Louisiana. Over the years, it absorbed influences from French and Spanish Catholicism, American Indian spiritual practices, and even Masonic tradition. Despite those adaptive mixings, many believers consider themselves to be Catholics and see no contradiction between Christianity and their faith in protective spirits and other tenets of voodoo. On a more familiar level, syncretism is reflected in subtle or blatant alterations of imported cuisines to make them conform to the demands of the American palate and fast-food franchises (**Figure 2.25**).



Figure 2.25 Foreign foods modified for American tastes represent syncretism in action.

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AP KEY WORDS

Use the terms below with a **I** to focus your study of AP Human Geography key words in this chapter.

I acculturation	culture complex	independent invention
artifact	I culture hearth	innovation
carrying capacity	culture realm	mentifact
I contagious diffusion	culture region	multilinear evolution
cultural autonomy	I culture trait	possibilism
cultural convergence	diffusion	I relocation diffusion
cultural divergence	domestication	sociofact
cultural ecology	environmental determinism	sociological subsystem
cultural integration	I expansion diffusion	I stimulus diffusion
I cultural landscape	I hierarchical diffusion	I syncretism
cultural system	hunter-gatherer	technological subsystem
I culture	ideological subsystem	

AP TEST PRACTICE

Multiple Choice Questions

- All of the following are components of culture EXCEPT:**
 - The language spoken in an area.
 - The tools and technology people use.
 - Religion and other shared beliefs.
 - Types of food, shelter, and clothing found in an area.
 - The migration of people from one area to another.
- The Burning Man Festival in the Black Rock desert of Nevada is an example of**
 - national culture found in the United States.
 - regional culture of the desert Southwest.
 - Native American culture that has become popularized.
 - a subculture of shared practices, technologies, attitudes, and behaviors.
 - a random group who takes over the area once a year to play music and make works of art.
- The spread of religious ideas as people migrate to new areas is an example of**
 - relocation diffusion.
 - expansion diffusion.
 - hierarchical diffusion.
 - contagious diffusion.
 - stimulus diffusion.
- An example of cultural influences on a population's health can be seen in**
 - the discovery of new cures for cancer.
 - UN workers vaccinating babies in developing countries.
 - the number of doctors and hospital beds per capita.
 - government provision of universal health care.
 - patterns of obesity in the Deep South.
- The spread of Christianity in Europe is an example of hierarchical diffusion because**
 - it spread from the nobility down to the peasants.
 - it was spread through the migration of Christians from the Middle East to Europe.
 - it spread from Rome to more provincial areas.
 - it was a grassroots movement that mainly appealed to the poor.
 - rulers and more educated people were able to read religious texts.
- Because of the phenomenon of friction of distance,**
 - cultures tend to change more quickly as they move farther from the hearth.
 - the farther away people are from one another, the more similar their cultures will be.
 - the farther away two areas are from one another, the more interaction they have.
 - populations that are close to one another geographically may experience more barriers that hinder interaction.
 - culture and technology in one area may spread more quickly to other nearby areas.
- While the Masai of Kenya and Tanzania disdain any job unrelated to herding cattle, they also measure wealth by ownership of cattle and eat a diet that includes milk and cow blood. Together, these aspects of culture make up a**
 - subculture.
 - culture complex.
 - culture region or realm.
 - national culture.
 - cultural ecology.

8. **The two photographs in Figure 2.17 on page 51 show**
- (A) the impact of traditional agricultural techniques on advanced cultures.
 - (B) the fact that developed countries are able to grow much more food than developing countries.
 - (C) the use of traditional artifacts in developing countries as contrasted to the use of advanced technology in developed countries.
 - (D) the importance of animals in developing countries, while developed countries no longer have animals on farms.
 - (E) that farmers in developing countries work much harder than those in developed countries.

9. **The photographs of people wearing various types of clothing in Figure 2.19 on page 53 illustrate the concept that**
- (A) religious differences are evidenced mainly through the clothing worn by adherents of various faiths.
 - (B) the purposes of clothing in a society can be to make a fashion statement, to protect the wearer, to delineate a person's job or status, or can be a requirement of a person's culture.
 - (C) people make value judgments based on the clothing worn by members of their society.
 - (D) people in more traditional societies wear clothing that is required by their cultures, while people in developed countries do not.
 - (E) the wearing of certain clothing is not at all influenced by geography.

10. **A major difference between traditional and more modern societies is that**
- (A) modern societies adapt to new ideas rapidly while traditional societies change more slowly or not at all.
 - (B) modern societies reject innovation while traditional societies recognize its value.
 - (C) hunter-gatherers, who lived in equilibrium with their surroundings, needed to innovate quickly in order to survive.
 - (D) innovation has very little impact on the culture of traditional people.
 - (E) larger urban centers tend to reject innovation while more rural communities embrace it.

Free Response Questions

1. **Use your own knowledge, as well as the map in Figure 2C on page 58, to answer the following questions.**
 - (A) Using the concepts of *hearth* and *distance decay*, explain the distribution of Wal-Mart stores shown on the map.
 - (B) Explain another example of the phenomenon of hearth and distance decay.
 - (C) Define *friction of distance* and explain its impact on diffusion.
2. **Answer Parts A, B, and C below.**
 - (A) Define the term *syncretism*.
 - (B) Name and explain two examples of syncretism.
 - (C) Explain the impact of syncretism on the culture of a country.
3. **Explain how natural barriers, political barriers, and social barriers can inhibit the spread of culture, giving examples of each.**