people, the Delta Plan called for the construction of several dams to close off most of the waterways from the North Sea. The project took 30 years to build and was completed in the mid-1980s.

Once these two massive projects were finished, attitudes toward modifying the environment changed in the Netherlands. The Dutch scrapped plans to build additional polders in the IJsselmeer in order to preserve the lake’s value for recreation.

The Dutch are deliberately breaking some of the dikes to flood fields. A plan adopted in 1990 called for returning 263,000 hectares (650,000 acres) of farms to wetlands or forests. Widespread use of insecticides and fertilizers on Dutch farms has contributed to contaminated drinking water, acid rain, and other environmental problems.

Global warming could threaten the Netherlands by raising the level of the sea around the country by between 20 and 58 centimeters (8 and 23 inches) within the next 100 years. Rather than build new dikes and polders, the Dutch have become world leaders in reducing the causes of global warming by acting to reduce industrial pollution and increase solar and wind power use, among other actions.

**SOUTH FLORIDA: NOT-SO-SENSITIVE ENVIRONMENTAL MODIFICATION.** Sensitive environmental areas in South Florida include barrier islands along the Atlantic and Gulf coasts, the wetlands between Lake Okeechobee and the Everglades National Park, and the Kissimmee River between Lake Kissimmee and Lake Okeechobee (Figure 1-22). These lowlands have been modified less sensitively than those in the Netherlands.

The Everglades was once a very wide and shallow freshwater river 80 kilometers (50 miles) wide and 15 centimeters (6 inches) deep, slowly flowing south from Lake Okeechobee to the Gulf of Mexico. A sensitive ecosystem of plants and animals once thrived in this distinctive landscape, but much of it has been destroyed by human actions.

The U.S. Army Corps of Engineers built a levee around Lake Okeechobee during the 1930s, drained the northern one-third of the Everglades during the 1940s, diverted the Kissimmee River into canals during the 1950s, and constructed dikes and levees near Miami and Fort Lauderdale during the 1960s. The southern portion of the Everglades became a National Park. These modifications opened up hundreds of thousands of hectares of land for growing sugarcane and protected farmland as well as the land occupied by the growing South Florida population from flooding. But they had unintended consequences for South Florida’s environment.

Polluted water mainly from cattle grazing along the banks of the canals flowed into Lake Okeechobee, which is the source of fresh water for half of Florida’s population. Fish in the lake began to die from the high levels of mercury, phosphorus, and other contaminants. The polluted water then continued to flow south into the National Park, threatening native vegetation such as sawgrass and endangering rare birds and other animals.

Meanwhile, Florida’s barrier islands are home to several hundred thousand people. These barrier islands, as well as those elsewhere along the Atlantic and Gulf coasts between Maine and Texas, are essentially large sandbars that shield the mainland from flooding and storm damage. They are constantly being eroded and shifted from the force of storms and pounding surf, and after a major storm, large sections are sometimes washed away. Despite their fragile condition, the barrier islands are attractive locations for constructing homes and recreational facilities to take advantage of proximity to the seashore. Most of the barrier islands are linked with the mainland by bridge, causeway, or ferry service. To fight erosion along the barrier islands, people build seawalls and jetties, which are structures extending into the sea, but these projects result in more damage than protection. A seawall or jetty can prevent sand from drifting away, but by trapping sand along the up-current side, it causes erosion on the barrier islands on the down-current side.

A 2000 plan called for restoring the historic flow of water through South Florida while improving flood control and water quality. A 2008 plan called for the state to acquire hundreds of thousands of acres of land from sugarcane growers. But to date, few elements of the plans to restore the Everglades have been implemented. One-half of the Everglades has been lost to development. In an ironic reminder of the Dutch saying quoted earlier, Floridians say, “God made the world in six days, and the Army Corps of Engineers has been tinkering with it ever since.”

**KEY ISSUE 3**

**Why Are Different Places Similar?**

- **Scale: From Local to Global**
- **Space: Distribution of Features**
- **Connections Between Places**

Although accepting that each place or region on Earth is unique, geographers recognize that human activities are rarely confined to one location. Discussed in this section are three basic concepts—scale, space, and connections—that help geographers understand why two places or regions can display similar features.

**Scale: From Local to Global**

Geographers think about scale at many levels, from local to global. At a local scale, such as an urban neighborhood, geographers tend to see unique features. At the global scale, encompassing the entire world, geographers tend to see broad patterns.
A generation ago, people concerned with environmental quality proclaimed, “Think global, act local.” The phrase meant that the environment was being harmed by processes such as global warming that were global in scale, but it could be improved by actions, such as consuming less gasoline, that were local in scale. Contemporary geographers offer a different version of the phrase: “Think and act both global and local.” All scales from local to global are important in geography—the appropriate scale depends on the specific subject.

Geography matters in the contemporary world because it can explain human actions at all scales, from local to global. At the national and international scales, geography is concerned with such questions as where the population is growing rapidly, where the followers of different religions live, and where corporations place factories. Geography also studies why these arrangements can cause problems. Why can rapid population growth exceed available food supply? Why are different religious groups unable to live in peace with each other? Why are some places unable to attract or retain industries?

Globalization of Economy

Scale is an increasingly important concept in geography because of globalization, which is a force or process that involves the entire world and results in making something worldwide in scope. Globalization means that the scale of the world is shrinking—not literally in size, of course, but in the ability of a person, object, or idea to interact with a person, object, or idea in another place.

People are plugged into a global economy and culture, producing a world that is more uniform, integrated, and interdependent. The world contains only a handful of individuals who lead such isolated and sheltered lives that they have never watched a television set, used a telephone, or been in a motor vehicle. Even extremely isolated and sheltered people are at least aware of the existence of these important means of connection.

A few people living in very remote regions of the world may be able to provide all of their daily necessities. The crop grown or product manufactured in a particular place may be influenced by the distinctive features and assets of the place.

FIGURE 1-22 Environmentally insensitive cultural ecology in Florida. To control flooding in central Florida, the U.S. Army Corps of Engineers straightened the course of the Kissimmee River, which had meandered for 160 kilometers (98 miles) from near Orlando to Lake Okeechobee. The water was rechanneled into a canal 90 meters wide (300 feet) and 9 meters deep (30 feet), running in a straight line for 84 kilometers (52 miles). After the canal, known as C-38, opened in 1971, millions of gallons of polluted water—mainly runoff from cattle grazing—began pouring into Lake Okeechobee, which is the major source of freshwater for about half of Florida’s population. The U.S. Army Corps of Engineers has returned the river from the canal (on the right side of the photograph) to its original course (on the left side).
But most economic activities undertaken in one region are influenced by interaction with decision makers located elsewhere. The choice of crop is influenced by demand and prices set in markets elsewhere. The factory is located to facilitate bringing in raw materials and shipping out products to the markets.

Globalization of the economy has been led primarily by transnational corporations, sometimes called multinational corporations (Figure 1-23). A transnational corporation conducts research, operates factories, and sells products in many countries, not just where its headquarters and principal shareholders are located.

Historically, people and companies had difficulty moving even small sums of money from one country to another. International transfer of money involved a cumbersome set of procedures, and funds could be frozen for several weeks until all of the paperwork cleared. Most governments prohibited the removal of large sums of money, and in the case of Communist countries, no money could be removed without government approval. Modern technology provides the means to easily move money—as well as materials, products, technology, and other economic assets—around the world. Thanks to the electronic superhighway, companies can now organize economic activities at a global scale.

Every place in the world is part of the global economy, but globalization has led to more specialization at the local level. Each place plays a distinctive role, based on its local assets. A place may be near valuable minerals, or it may be inhabited by especially well-educated workers. Transnational corporations assess the particular economic assets of each place. A locality may be especially suitable for a transnational corporation to conduct research, to develop new engineering systems, to extract raw materials, to produce parts, to store finished products, to sell them, or to manage operations. In a global economy, transnational corporations remain competitive by correctly identifying the optimal location for each of these activities.

Globalization of the economy has heightened economic differences among places. Factories are closed in some locations and opened in others. Some places become centers for technical research, whereas others become centers for low-skilled tasks. Changes in production have led to a spatial division of labor, in which a region's workers specialize in particular tasks. Transnationals decide where to produce things in response to characteristics of the local labor force, such as level of skills, prevailing wage rates, and attitudes toward unions. Transnationals may close factories in locations with high wage rates and strong labor unions.

The deep recession that began in 2008 has been called the first global recession. Past recessions were typically confined to one country or region. For example, financial policies in Thailand triggered a severe recession there and in neighboring countries of Southeast Asia in 1997 but had little impact on the economies of the United States and Europe. In contrast, the global economy declined in 2009 for the first time in more than a half-century. Although every region suffered economic decline, the effects of the global recession varied. The fate of a home buyer in the United States was tied to the fate of a banker in United Kingdom, a sales clerk in Japan, a clothing maker in China, and a construction worker in Nigeria. All were caught in a global-scale web of falling demand and lack of credit.
Globalization of Culture

Geographers observe that increasingly uniform cultural preferences produce uniform “global” landscapes of material artifacts and of cultural values (Figure 1-24). Houses built on the edge of one urban area will look very much like houses built on the edge of urban areas in other regions. Fast-food restaurants, service stations, and retail chains deliberately create a visual appearance that varies among locations as little as possible. That way, customers know what to expect regardless of where in the world they happen to be.

Regardless of local cultural traditions, people around the world aspire to drive an automobile, watch television, and own a house. The survival of a local culture’s distinctive beliefs, forms, and traits may be threatened by interaction with such social customs as wearing jeans and Nike shoes, consuming Coca-Cola and McDonald's hamburgers, and communicating by cell phone and computer. Underlying the uniform cultural landscape is globalization of cultural beliefs and forms, especially religion and language. Africans, in particular, have moved away from traditional religions and have adopted Christianity or Islam, religions shared with hundreds of millions of people throughout the world. Globalization requires a form of common communication, and the English language is increasingly playing that role.

As more people become aware of elements of global culture and aspire to possess them, local cultural beliefs, forms, and traits are threatened with extinction. Yet despite globalization, cultural differences among places not only persist but actually flourish in many places. Global standardization of products does not mean that everyone wants the same cultural products.

The communications revolution that promotes globalization of culture also permits preservation of cultural diversity. TV, for example, was once limited to a handful of channels displaying one set of cultural values. With the distribution of programming through cable and satellite systems, people now can choose from hundreds of programs in more than one language.

With the globalization of communications, people in two distant places can watch the same television program. At the same time, with the fragmentation of the broadcasting market, two people in the same house can watch different programs. Groups of people on every continent may aspire to wear jeans, but they might live with someone who prefers skirts. In a global culture, companies can target groups of consumers with similar tastes in different parts of the world.

Strong determination on the part of a group to retain its local cultural traditions in the face of globalization of culture can lead to intolerance of people who display other beliefs, social forms, and material traits. Political disputes, unrest, and wars have erupted in places such as Southeast Europe, East Africa, and the Middle East, where different cultural groups have been unable to share the same space peacefully (see Chapter 7).

A much more extreme opposition to globalization led to the attack by al-Qaeda terrorists against the United States on September 11, 2001, with support from the Taliban, then in control of Afghanistan (Chapter 8). Al-Qaeda selected targets—the World Trade Center and the Pentagon—it considered especially visible symbols of U.S. domination of globalization trends in culture, politics, and the economy. Afghanistan’s Taliban leaders justified such actions as banning television and restricting women’s activities as being consistent with local traditions, and such punishments as public floggings and severing of limbs as being a necessary counterbalance to strong forces of globalization.

Culturally, people residing in different places are displaying fewer differences and more similarities in their cultural preferences. But although consumers in different places express increasingly similar cultural preferences, they do not share the same access to them. And the desire of some people to retain their traditional cultural elements, in the face of increased globalization of cultural preferences, has led to political conflict and market fragmentation in some regions. Globalization has not destroyed the uniqueness of an individual place’s culture and economy. Human geographers understand that many contemporary social problems result from a tension between forces promoting global culture and economy on the one hand and preservation of local economic autonomy and cultural traditions on the other hand.

FIGURE 1-24 Globalization of culture. Algiers, the capital of Algeria, has one of the world’s highest per capita ownership of satellite dishes.
Space: Distribution of Features

Chess and computer games, where pieces are placed on a grid-shaped playing surface, require thinking about space. Pieces are arranged on the game board or screen in order to outmaneuver an opponent or form a geometric pattern. To excel at these games, a player needs spatial skills, the ability to perceive the future arrangement of pieces. Similarly, spatial thinking is the most fundamental skill that geographers possess to understand the arrangement of objects across surfaces considerably larger than a game board. Geographers think about the arrangement of people and activities found in space and try to understand why those people and activities are distributed across space as they are.

In his framework of all scientific knowledge, the German philosopher Immanuel Kant (1724–1804) compared geography’s concern for space to history’s concern for time. Historians identify the dates of important events and explain why human activities follow one another chronologically. Geographers identify the location of important places and explain why human activities are located beside one another in space. Historians ask when and why. Geographers ask where and why. Historians organize material chronologically because they understand that an action at one point in time can result from past actions that can in turn affect future ones. Geographers organize material spatially because they understand that an action at one point in space can result from something happening at another point, which can consequently affect conditions elsewhere.

History and geography differ in one especially important manner: A historian cannot enter a time machine to study other eras firsthand; however, a geographer can enter an automobile or airplane to study other spaces. This ability to reach other spaces lends excitement to the discipline of geography—and geographic training raises the understanding of other spaces to a level above that of casual sightseeing.

Distribution

Look around the space you currently occupy—perhaps a classroom, residence hall, or room in a house. Tables, chairs, and other large objects are arranged regularly, such as in a row in a classroom or against a wall at home (though books and papers may be strewn about the space randomly). The room is located in a building that occupies an organized space—along a street, a side of a quadrangle, or next to a park. Similarly, the community containing the campus or house is part of a system of communities arranged across the country and around the world.

Each building and community, as well as every other human or natural object, occupies a unique space on Earth, and geographers explain how these features are arranged across Earth. On Earth as a whole, or within an area of Earth, features may be numerous or scarce, close together or far apart. The arrangement of a feature in space is known as its distribution. Geographers identify three main properties of distribution across Earth—density, concentration, and pattern (Figure 1-25).

Density. The frequency with which something occurs in space is its density. The feature being measured could be people, houses, cars, volcanoes, or anything. The area could be measured in square kilometers, square miles, hectares, acres, or any other unit of area.

Arithmetic density, which is the total number of objects in an area, is commonly used to compare the distribution of population in different countries. The arithmetic density of Belgium, for example, is 345 persons per square kilometer (900 persons per square mile). This density is the country’s total population (10.5 million people) divided by its area (30,278 square kilometers, or 11,690 square miles).

Remember that a large population does not necessarily lead to a high density. Arithmetic density involves two measures—the
number of people and the land area. The most populous country in the world, China, with approximately 1.3 billion inhabitants, by no means has the highest density. The arithmetic density of China—139 persons per square kilometer (360 persons per square mile)—is less than half that of Belgium. Although China has 123 times more inhabitants than Belgium, it has more than 300 times more land.

High population density is also unrelated to poverty. The Netherlands, one of the world’s wealthiest countries, has an arithmetic density of 398 persons per square kilometer (1,031 persons per square mile). One of the poorest countries, Mali, has an arithmetic density of only 10 persons per square kilometer (26 persons per square mile).

Geographers measure density in other ways, depending on the subject being studied. A high physiological density—the number of persons per unit of area suitable for agriculture—may mean that a country has difficulty growing enough food to sustain its population. A high agricultural density—the number of farmers per unit area of farmland—may mean that a country has inefficient agriculture (see Chapter 2). A high housing density—the number of dwelling units per unit of area—may mean that people live in overcrowded housing.

**CONCENTRATION.** The extent of a feature’s spread over space is its concentration. If the objects in an area are close together, they are clustered; if relatively far apart, they are dispersed. To compare the level of concentration most clearly, two areas need to have the same number of objects and the same size area.

Geographers use concentration to describe changes in distribution. For example, the distribution of people across the United States is increasingly dispersed. The total number of people living in the United States is growing slowly—less than 1 percent per year—and the land area is essentially unchanged. But the population distribution is changing from relatively clustered in the Northeast to more evenly dispersed across the country.

Concentration is not the same as density (Figure 1-26). Two neighborhoods could have the same density of housing but different concentrations. In a dispersed neighborhood, each house has a large private yard, whereas in a clustered neighborhood, the houses are close together and the open space is shared as a community park.

We can illustrate the difference between density and concentration at a far larger scale than a neighborhood. Within North America the distribution of major-league baseball teams changed during the second half of the twentieth century after remaining unchanged during the first half of the twentieth century. The major leagues expanded from 16 to 30 teams in North America between 1960 and 1998, thus increasing the density. At the same time, 6 of the 16 original teams moved to other locations. In 1952, every team was clustered in the Northeast United States, but the moves dispersed several teams to the West Coast and Southeast. These moves, as well as the spaces occupied by the expansion teams, resulted in a more dispersed distribution.

**PATTERN.** The third property of distribution is pattern, which is the geometric arrangement of objects in space. Some features are organized in a geometric pattern, whereas others are distributed irregularly (Figure 1-27). Geographers observe that many objects form a linear distribution, such as the arrangement of houses along a street or stations along a subway line.

Objects are frequently arranged in a square or rectangular pattern. Many American cities contain a regular pattern of streets, known as a grid pattern, which intersect at right angles at uniform intervals to form square or rectangular blocks. The system of townships, ranges, and sections established by the
Land Ordinance of 1785 is another example of a square or grid pattern.

A sinister pattern of two dozen pipe bombs was placed on the American landscape in 2002 by Lucas Helder, a University of Wisconsin-Stout art student. The bomber confessed that he was trying to create a large “smile” pattern across the U.S. interior. He got as far as creating the two “eyes” by placing bombs in two large circles, one in Nebraska and one in eastern Iowa and western Illinois. Before being caught, he also placed bombs in Colorado and Texas to start the “mouth.”

Gender and Ethnic Diversity in Space

Patterns in space vary according to gender and ethnicity. Consider first the daily patterns of an “all-American” family of mother, father, son, and daughter. Leave aside for the moment that this type of family constitutes less than one-fourth of American households.

In the morning Dad gets in his car and drives from home to work, where he parks the car and spends the day; then, in the late afternoon, he collects the car and drives home. The location of the home was selected in part to ease Dad’s daily commute to work.

The mother’s local-scale travel patterns are likely to be far more complex than the father’s. Mom takes the children to school and returns home. She also drives to the supermarket, visits Grandmother, and walks the dog. In between she organizes the several thousand square feet of space that the family calls home. In the afternoon, she picks up the youngsters at school and takes them to Little League or ballet lessons. Later, she brings them home, just in time for her to resume her responsibility for organizing the home.

Most American women are now employed at work outside the home, adding a substantial complication to an already complex pattern of moving across urban space. Where is her job located? The family house was already selected largely for access to Dad’s place of employment, so Mom may need to travel across town. Who leaves work early to drive a child to a doctor’s office? Who takes a day off work when a child is at home sick?

The importance of gender in space is learned as a child. Which child—the boy or girl—went to Little League and which went to ballet lessons? To which activity is substantially more land allocated in a city—ballfields or dance studios?

If the family described above consisted of persons of color, its connections with space would change. The effects of race on spatial interaction can be seen across America. In downtown Dayton, Ohio, for example, watch the people at the bus stops along the main east–west street, Third Street. In the afternoon, when office workers are heading home, persons of color are waiting on the north side of Third Street for westbound buses, while whites are waiting on the south side for eastbound buses. Why do persons of color head west on Dayton’s afternoon buses? Virtually all African Americans in Dayton live on the west side, whereas the east side is home to a virtually all-white population. In most U.S. neighborhoods, the residents are virtually all white people or virtually all persons of color.

Although it is illegal to discriminate against people of color, segregation persists in part because people want to reinforce their cultural identity by living near persons of similar background and in part because persons of color have lower-than-average incomes. But many Americans of European ancestry still practice discrimination because of a deep-seated fear of spatial interaction with a person of color.

Openly homosexual men and lesbian women may be attracted to some locations to reinforce spatial interaction with other gays. San Francisco reinforces its reputation as a sympathetic home for homosexuals and lesbians through inclusive public policies (Figure 1-28). Specific neighborhoods in other cities are known to have large gay populations.

A pet dog doesn’t care if you are male or female, black or white, gay or not. As long as you feed it, take care of it, and maintain close spatial interaction with it, your dog will respond with
total, unquestioned devotion. Although dogs don’t care about these cultural traits, people do. They are key characteristics to which people refer in order to identify who they are.

Cultural identity is a source of pride to people at the local scale and an inspiration for personal values. Even more important than self-identification, these traits matter to other people. They are the criteria by which other people classify us and choose to interact with us. Whatever biological basis may or may not exist for distinguishing among humans, differences in gender, race, and sexual orientation are first and foremost constructed by the attitudes and actions of others. Geographers consider cultural identity to be important in understanding spatial interaction, because humans repeatedly demonstrate that these factors are important in explaining why they sort themselves out in space and move across the landscape in distinctive ways.

All academic disciplines and workplaces have proclaimed sensitivity to issues of cultural diversity. For geographers, concern for cultural diversity is not merely a politically correct expediency; it lies at the heart of geography’s spatial tradition. Nor is geographers’ deep respect for the dignity of all cultural groups merely a matter of political correctness; it lies at the heart of geography’s explanation of why each place on Earth is unique.

Connections Between Places

Geographers increasingly think about connections among places and regions. More rapid connections have reduced the distance across space between places, not literally in miles, of course, but in time.

Geographers apply the term space-time compression to describe the reduction in the time it takes for something to reach another place. Distant places seem less remote and more accessible to us. We know more about what is happening elsewhere in the world, and we know sooner. Space-time compression promotes rapid change, as the culture and economy of one place reach other places much more quickly than in the past (Figure 1-29). With better connections between places, people in one region are now exposed to a constant barrage of cultural traits and economic initiatives from people in other regions, and they may adopt some of these cultural and economic elements. Geographers explain the process, called diffusion, by which connections are made between regions, as well as the mechanism by which connections are maintained through networks.
Spatial Interaction

In the past, most forms of interaction among cultural groups required the physical movement of settlers, explorers, and plunderers from one location to another. As recently as A.D. 1800, people traveled in the same ways and at about the same speeds, as in 1800 B.C.—they were carried by an animal, took a sailboat, or walked.

Today, travel by motor vehicle or airplane is much quicker. But we do not even need to travel to know about another place. We can transmit images and messages from one part of the world to another at the touch of a button. We can communicate instantly with people in distant places through computers and telecommunications, and we can instantly see people in distant places on television. The various forms of communication have made it possible for people in different places to be aware of the same cultural beliefs, forms, and traits. When places are connected to each other through a network, geographers say there is spatial interaction between them. Interaction takes place through networks, which are chains of communication that connect places. A well-known example of a network in the United States is the television network (ABC, CBS, FOX, NBC, PBS). Each comprises a chain of stations around the country simultaneously broadcasting the same program, such as a football game.

Transportation systems also form networks that connect places to each other. Airlines in the United States, for example, have adopted distinctive networks known as “hub-and-spokes” (Figure 1-30). Under the hub-and-spokes system, airlines fly planes from a large number of places into one hub airport within a short period of time and then a short time later send the planes to another set of places. In principle, travelers originating in relatively small towns can reach a wide variety of destinations by changing planes at the hub airport.

Interaction among groups can be retarded by barriers. These can be physical, such as oceans and deserts, or cultural, such as language and traditions. We regard the landscape as part of our inheritance from the past. As a result, we may be reluctant to modify it unless we are under heavy pressure to do so. A major change in the landscape may reflect an upheaval in a people’s culture. Typically, the farther away one group is from another, the less likely the two groups are to interact. Contact diminishes with increasing distance and eventually disappears. This trailing-off phenomenon is called distance decay. Electronic communications, such as text messaging and e-mail, have removed barriers to interaction between people who are far from each other. The birth of these electronic communications was once viewed as the “death” of geography, because they made it cheap and easy to stay in touch with someone on the other side of the planet. Regardless of its location, a business could maintain instantaneous communications among employees and with customers.

In reality, geography matters even more than before. Internet access depends upon availability of electricity to power the computer and a service provider. Broadband service requires proximity to a digital subscriber line (DSL) or cable line. The Internet has also magnified the importance of geography, because when an individual is online, the specific place in the world where the individual is located is known. This knowledge is valuable information for businesses that target advertisements and products to specific tastes and preferences of particular places (see Chapter 12).

Diffusion

Diffusion is the process by which a characteristic spreads across space from one place to another over time. Today, ideas that originate in one area diffuse rapidly to other areas through sophisticated communications and transportation networks. As a result of diffusion, interaction in the contemporary world is complex. People in more than one region may improve and modify an idea at the same time but in different ways.

The place from which an innovation originates is called a hearth. Something originates at a hearth or node and diffuses from there to other places. Geographers document the location of nodes and the processes by which diffusion carries things elsewhere over time. How does a hearth emerge? A cultural group must be willing to try something new and be able to allocate resources to nurture the innovation. To develop a hearth, a group of people must also have the technical ability to achieve the desired idea and the economic structures, such as financial institutions, to facilitate implementation of the innovation.

FIGURE 1-30 Continental Airlines’ network. Continental, like other major U.S. airlines, has configured its route network in a system known as “hub and spokes.” Lines connect each airport to the city to which it sends the most nonstop flights. Most flights originate or end at one of the company’s hubs, especially at Houston, Newark, and Cleveland.
As discussed in subsequent chapters, geographers can trace the dominant cultural, political, and economic features of the contemporary United States and Canada primarily to hearths in Europe and the Middle East. Other regions of the world also contain important hearths. In some cases an idea, such as an agricultural practice, may originate independently in more than one hearth. In other cases, hearths may emerge in two regions because two cultural groups modify a shared concept in two different ways.

For a person, object, or idea to have interaction with persons, objects, or ideas in other regions, diffusion must occur. Geographers observe two basic types of diffusion—relocation and expansion.

**RELOCATION DIFFUSION.** The spread of an idea through physical movement of people from one place to another is termed relocation diffusion. We shall see in Chapter 3 that people migrate for a variety of political, economic, and environmental reasons. When they move, they carry with them their culture, including language, religion, and ethnicity.

The most commonly spoken languages in North and South America are Spanish, English, French, and Portuguese, primarily because several hundred years ago Europeans who spoke those languages comprised the largest number of migrants. Thus these languages spread through relocation diffusion. We will examine the diffusion of languages, religions, and ethnicity in Chapters 5 through 7.

Introduction of a common currency, the euro, in 12 Western European countries gave scientists an unusual opportunity to measure relocation diffusion from hearths (Figure 1-31). Although a single set of paper money was issued, each of the 12 countries minted its own coins in proportion to its share of the region’s economy. A country’s coins were initially distributed only inside its borders, although the coins could also be used in the other 11 countries. Scientists took month-to-month samples in France to monitor the proportion of coins from each of the other 11 countries. The percentage of coins from a particular country is a measure of the level of relocation diffusion to and from France.

Relocation diffusion helps us understand the distribution of acquired immunodeficiency syndrome (AIDS) within the United States. New York, California, and Florida were the nodes of origin for the disease within the United States during the early 1980s (Figure 1-32). Half of the 50 states had no reported cases, whereas New York City, with only 3 percent of the nation’s population, contained more than one-fourth of the AIDS cases. New AIDS cases diffused to every state during the 1980s and early 1990s, although California, Florida, and New York remained the hearths. These three states, plus Texas, accounted for half of the nation’s new AIDS cases in the peak year of 1993. At a national scale, the

**FIGURE 1-31** Relocation diffusion. Introduction of a common currency, the euro, in 12 Western European countries on January 1, 2002, gave scientists an unusual opportunity to measure relocation diffusion. The percentage of “foreign” euro coins is a measure of the level of relocation diffusion into France.
The Cultural Landscape

diffusion of AIDS in the United States through relocation halted after 1993. The number of new AIDS cases dropped by one-fourth in just two years.

Relocation diffusion can explain the rapid rise in the number of AIDS cases in the United States during the 1980s and early 1990s, but not the rapid decline beginning in the mid-1990s. Instead, the decline resulted from the rapid diffusion of preventive methods and medicines such as AZT. The rapid spread of these innovations is an example of expansion diffusion rather than relocation diffusion.

**EXPANSION DIFFUSION.** The spread of a feature from one place to another in a snowballing process is expansion diffusion. This expansion may result from one of three processes:
Hierarchical diffusion is the spread of an idea from persons or nodes of authority or power to other persons or places. Hierarchical diffusion may result from the spread of ideas from political leaders, socially elite people, or other important persons to others in the community.

Innovations may also originate in a particular node or place of power, such as a large urban center, and diffuse later to isolated rural areas. Hip-hop or rap music is an example of an innovation that diffused from low-income African Americans rather than from socially elite people, but it originated in urban areas.

Contagious diffusion is the rapid, widespread diffusion of a characteristic throughout the population. As the term implies, this form of diffusion is analogous to the spread of a contagious disease, such as influenza. Contagious diffusion spreads like a wave among fans in a stadium, without regard for hierarchy and without requiring permanent relocation of people.

The rapid adoption throughout the United States of AIDS prevention methods and new medicines is an example of contagious diffusion. An idea placed on the World Wide Web spreads through contagious diffusion, because Web surfers throughout the world have access to the same material simultaneously—and quickly.

Stimulus diffusion is the spread of an underlying principle, even though a characteristic itself apparently fails to diffuse. For example, early desktop computer sales in the United States were divided about evenly between Macintosh Apple and IBM-compatible DOS systems. By the 1990s, Apple sales had fallen far behind IBM-compatibles in the United States, and the company had limited presence in rapidly expanding overseas markets. But principles pioneered by Apple, notably making selections by pointing a mouse at an icon rather than typing a string of words, diffused through a succession of IBM-compatible Windows systems.

Expansion diffusion occurs much more rapidly in the contemporary world than in the past:

- Hierarchical diffusion is encouraged by modern methods of communications, such as computers, facsimile machines, and electronic mail systems
- Contagious diffusion is encouraged by use of the Internet, especially the World Wide Web.
- Stimulus diffusion is encouraged by all of the new technologies.

Diffusion from one place to another can be instantaneous in time, even if the physical distance between two places—as measured in kilometers or miles—is large.

**DIFFUSION OF CULTURE AND ECONOMY.** In a global culture and economy, transportation and communications systems rapidly diffuse raw materials, goods, services, and capital from nodes of origin to other regions. Every area of the world plays some role intertwined with the roles played by other regions. Workers and cultural groups that in the past were largely unaffected by events elsewhere in the world now share a single economic and cultural world with other workers and cultural groups. The fate of an autoworker in Detroit is tied to investment decisions made in Mexico City, Seoul, Stuttgart, and Tokyo.

Global culture and economy are increasingly centered on the three core or hearth regions of North America, Western Europe, and Japan. These three regions have a large percentage of the world’s advanced technology, capital to invest in new activities, and wealth to purchase goods and services. From “command centers” in the three major world cities of New York, London, and Tokyo, key decision makers employ modern telecommunications to send out orders to factories, shops, and research centers around the world, an example of hierarchical diffusion. Meanwhile, “nonessential” employees of the companies can be relocated to lower-cost offices outside the major financial centers. For example, Fila maintains headquarters in Italy but has moved 90 percent of its production of sportswear to Asian countries. Mitsubishi’s corporate offices are in Japan, but all of its VCRs and DVDs are produced in other Asian countries.

Countries in Africa, Asia, and Latin America contain three-fourths of the world’s population and nearly all of its population growth, but they find themselves on a periphery, or outer edge, of global investment that arrives through hierarchical diffusion of decisions made by transnational corporations through hierarchical diffusion. People in peripheral regions, who once toiled in isolated farm fields to produce food for their families, now produce crops for sale in core regions or have given up farm life altogether and migrated to cities in search of jobs in factories and offices. As a result, the global economy has produced greater disparities than in the past between the levels of wealth and well-being enjoyed by people in the core and in the periphery. The increasing gap in economic conditions between regions in the core and periphery that results from the globalization of the economy is known as uneven development.

Many people take for granted the ability to watch events in distant places through television, speak to others in distant places by telephone, and travel to far-off places by motor vehicle. An increasing number of the world’s population regard access to these communications systems as novelties, perhaps recently experienced for the first time. For some people, access to these cultural elements is a distant aspiration. Knowledge of these communications systems is global, but the ability to purchase them is not. Access to television, telephones, motor vehicles, and other means of communicating culture is restricted by an uneven division of wealth in the world. In some regions possession of these objects is widespread, but in other regions few people have enough wealth to buy them. Even within regions, access to cultural elements may be restricted because of uneven distribution of wealth or because of discrimination against women or minority groups.