

## Chapter 1. Thinking Geographically

Contemporary geography is the scientific study of the location of people and activities across Earth, and the reasons for their distribution. The ancient Greek scholar Eratosthenes coined the word geography from two Greek words, *geo* meaning *earth* and *graphy* meaning *to write*. Geography asks two simple questions: *where* and *why*.

Geography is divided broadly into two categories—*human* geography and *physical* geography. Human geography studies where and why human activities are located as they are. Physical geography studies where and why natural forces occur as they do. This book focuses on human geography, but it never forgets Earth's atmosphere, land, water, vegetation, and other living creatures. Because geographers are trained in both social and physical sciences, they are particularly well equipped to understand interactions between people and their environment.

(3)

### Key Issues

1. How do geographers describe where things are?
2. Why is each point on Earth unique?
3. Why are different places similar?

(4)

Geographers observe that people are being pulled in opposite directions by two factors: globalization and local diversity. Tensions between the simultaneous geographic trends of globalization and local diversity underlie many of the world's problems that geographers study, such as political conflicts, economic uncertainty, and pollution of the environment.

This book . . . concentrates on two main features of human behavior: culture and economy. Distinctive geographic approaches concentrate on five aspects in thinking about the world: space, place, regions, scale, and connections. These five distinctive ways that geographers think about the world are discussed in detail in this chapter.

(6)

### Key Issue 1. How Do Geographers Address *Where* Things Are?

- **Maps**
- **Contemporary Tools**

Geographers think about the arrangements of people and activities found in space and try to understand why those people and activities are distributed across space as they are.

Geographers use maps as a method of depicting the distribution of features and as a tool for explaining observed patterns.

(7)

### Maps

Geography's most important tool for thinking spatially about the distribution of features across Earth is a map. A **map** is a two-dimensional or flat-scale model of Earth's surface, or a portion of it. For centuries geographers have worked to perfect the science of mapmaking, called **cartography**. A map serves two purposes: a tool for storing reference material and a tool for communicating geographic information. A map is often the best means for depicting

the distribution of human activities or physical features, as well as for thinking about reasons underlying a distribution.

### **Early Mapmaking**

The earliest surviving maps were drawn by Babylonians on clay tablets about 2300 B.C., but mapmaking is undoubtedly even older. Polynesian peoples navigated for thousands of years with three dimensional maps.

Mediterranean sailors and traders made maps of rock formation, islands, and ocean currents as early as 800 B.C.

**Aristotle** (384–322 B.C.) was the first to demonstrate the earth was spherical. He observed the curved shadow of the earth on the moon during an eclipse and the fact that the visible groups of stars change as one travels north or south. Eratosthenes (276?–194? B.C.), the first person on record to use the word geography, calculated the circumference of the earth and made one of the earliest maps of the known world, correctly dividing Earth into five climatic regions.

**Ptolemy** (A.D. 100?–170?) wrote an eight-volume *Guide to Geography*, taking advantage of information collected by merchants and soldiers who traveled throughout the Roman Empire.

**(Non-European).** After Ptolemy little progress in mapmaking or geographic thought was made in Europe for hundreds of years, although geographic inquiry continued outside of Europe. Phei Hsiu (or Fei Xiu), the "father of Chinese cartography," produced an elaborate map of China in A.D. 267. The Muslim geographer al-Idrisi (1100–1165?) prepared a world map and geography text in 1154, building on Ptolemy's work. Ibn-Battutah (1305–1368?) wrote *Rihlah* (Travels) based on three decades of journeys.

**(Age of Exploration and Discovery).** Geography and mapmaking enjoyed a revival during the Age of Exploration and Discovery. By the seventeenth century, maps accurately displayed the outline of most continents and the position of oceans.

(9)

### **Map Scale**

The **scale** of a map is the relation of a feature's size on a map and its actual size on Earth's surface. Map scale is represented in three ways: a fraction (1/24,000) or ratio (1:24,000), a written statement ("1 inch equals 1 mile"), or a graphic bar scale.

A graphic scale usually consists of a bar line marked to show distances on Earth's surface. The bar line is used by measuring a distance on the map, then reading that distance along the bar line. The appropriate scale for a map depends on the information being portrayed.

(11)

### **Projection**

To communicate geographic concepts effectively through maps, cartographers must design them properly and assure that users know how to read them. Earth's spherical shape poses a challenge for cartographers because drawing Earth on a flat piece of paper unavoidably produces some distortion. The scientific method of transferring location on Earth's surface to a flat map is called projection.

Four types of distortion can result: *shape* can be distorted, *distance* may be increased or decreased, *relative size* may be altered, and *direction* between points can be distorted. Most of the world maps in this book are *equal area projections*.

### **U.S. Land Ordinance of 1785**

In addition to the global system of latitude and longitude, other mathematical indicators of locations are used in different parts of the world. In the United States, the Land Ordinance of 1785 divided much of the country into a system of townships and ranges to facilitate the sale of land to settlers in the West.

In this system, a township is a square 6 miles on each side. Some of the north-south lines separating townships are called principal meridians and some east-west lines are designated base lines. Each township has a number corresponding to its distance north or south of a particular base line. Each township has a second number, known as the range, corresponding to its location east or west of a principal meridian. A township is divided into 36 sections, each of which is 1 mile by 1 mile. Each section is divided into four quarter-sections. A quarter-section, which is 0.5 mile by 0.5 mile, or 160 acres, was the amount of land many western pioneers bought as a homestead.

(12)

### **Contemporary Tools**

Two important technologies that developed during the past quarter century are remote sensing from satellites (to collect data) and geographic information systems (computer programs for manipulating geographic data).

### **GIS**

A **geographic information system (GIS)** is a high-performance computer system that processes geographic data. Each type of information (topography, political boundaries, population density, manufacturing, soil type, earthquake faults, and so on) is stored as an information layer. GIS is most powerful when it is used to combine several layers, to show relations.

### **Remote Sensing**

The acquisition of data about Earth's surface from a satellite orbiting Earth or from other long-distance methods is known as remote sensing. The smallest feature on Earth's surface that can be detected by a sensor is the resolution of the scanner. Some can show an object 1 meter across. Weather satellites take a broader view, looking at several kilometers at a time.

(14)

### **GPS**

The **Global Positioning System (GPS)** is an example of applying new technology to an old human habit: consulting a map to get to a desired destination. The GPS can pinpoint a location using signals from a group of satellites.

(15)

### **Key Issue 2. Why Is Each Point on Earth Unique?**

- **Place: Unique location of a feature**
- **Regions: Areas of unique characteristics**

The interplay between the uniqueness of each place and the similarities among places lies at the heart of geographic inquiry into why things are found where they are. Two basic concepts help geographers to explain why every point on Earth is in some ways unique: place and region. The difference between the two concepts is partly a matter of scale: a place is a point, whereas a region is an area.

Humans possess a strong sense of place—that is, a feeling for the features that contribute to the distinctiveness of a particular place, perhaps a hometown or vacation spot.

### **Place: Unique location of a feature**

Geographers identify the location of something in four ways—by place-name, site, situation, and mathematical location.

### **Place Names**

Geographers call the name given to a portion of Earth's surface its **toponym** (literally, place-name). The name of a place may give us a clue about its founders, physical setting, social customs, or political changes. Some place-names derive from features of the physical environment. The name of a place can tell us a lot about the social customs of its early inhabitants. The Board of Geographical Names, operated by the U.S. Geological Survey, was established in the late nineteenth century to be the final arbiter of name on U.S. maps. Places can change names, possibly to commemorate a particular event. After the fall of communism in the early 1990s, names throughout Eastern Europe were changed, in many cases reverting to those used before the Communists had gained power a few decades earlier.

(16)

### **Site**

The second way that geographers describe the location of a place is by **site**, which is the physical character of a place. Important site characteristics include climate, water sources, topography, soil, vegetation, latitude, and elevation. Humans have the ability to modify the characteristics of a site. The central areas of Boston and Tokyo have been expanded through centuries of landfilling in nearby bays.

### **Situation**

Situation is the location of a place relative to other places. Situation is a good way to indicate location for two reasons—finding an unfamiliar place and understanding its importance. Many locations are important because they are accessible to other places.

(18)

### **Mathematical Location**

The location of any place on Earth's surface can be described precisely by meridians and parallels, two sets of imaginary arcs drawn in a grid pattern on Earth's surface. A **meridian** is an arc drawn between the North and South poles. A **parallel** is a circle drawn around the globe parallel to the equator. The location of each meridian is identified on Earth's surface according to a numbering system known as **longitude**. The **prime meridian**, 0° longitude, passes through the Royal Observatory at Greenwich, England. All other meridians have numbers between 0° and 180° east or west of Greenwich.

The numbering system to indicate the location of a parallel is called **latitude**. The equator is 0° latitude, the North Pole is 90° north latitude, and the South Pole is 90° south latitude. The

mathematical location of a place can be designated more precisely by dividing each degree into 60 minutes and each minute into 60 seconds.

**Determining Longitude.** Measuring latitude and longitude is a good example of how geography is partly a natural science and partly a study of human behavior. Latitudes are scientifically derived by Earth's shape and its rotation around the Sun. On the other hand, 0° longitude is a human creation. The 0° longitude runs through Greenwich because England was the world's most powerful country when longitude was first accurately measured and the international agreement was made.

**Telling Time from Longitude.** Longitude plays an important role in calculating time. Traveling 15° east is the equivalent of traveling one hour forward on the clock, and 15° west is one hour backward.

Earth is divided into 24 standard time zones, one for each hour of the day, so each time zone represents 15° of longitude. Before standard time zones were created, each locality set its own time. The international agreement (in 1884) designated the time at the prime meridian as **Greenwich Mean Time (GMT) or Universal Time (UT)**. The eastern United States, which is near 75° west longitude, is five hours earlier than Greenwich Mean Time. When you cross the **International Date Line**, which for the most part follows 180° longitude, you move the clock back 24 hours, or one entire day, if you are heading eastward toward America. You turn the clock ahead 24 hours if you are heading westward toward Asia.

(20)

### **Regions: Areas of Unique Characteristics**

An area of Earth defined by one or more distinctive characteristics is a **region**. A region derives its unified character through the **cultural landscape**, a combination of cultural features such as language and religion, economic features such as agriculture and industry, and physical features such as climate and vegetation.

### **Cultural Landscape**

The contemporary **cultural landscape** approach in geography—sometimes called the **regional studies** approach—was initiated in France. It was later adopted by several American geographers, who argued that each region has its own distinct landscape that results from a unique combination of social relationships and physical processes.

### **Types of Regions**

Geographers most often apply the concept region at one of two scales: either several neighboring countries that share important features, such as those in Latin America, or many localities within a country, such as those in southern California. A particular place can be included in more than one region depending on how the region is defined. Geographers identify three types of regions: formal, functional, and vernacular.

(20)

**Formal Region.** A formal region, also called a uniform region or a homogeneous region, is an area within which everyone shares in common one or more distinctive characteristics.

Some formal regions are easy to identify, such as countries or local government units. In other kinds of formal regions a characteristic may be predominant rather than universal. For example, the wheat belt of North America also grows other crops. A cautionary step in

identifying formal regions is the need to recognize the diversity of cultural, economic, and environmental factors, even while making a generalization.

(22)

**Functional Region.** A functional region, also called a nodal region, is an area organized around a node or focal point. The region is tied to the central point by transportation or communications systems or by economic or functional associations. An example of a functional region is the circulation area of a newspaper. New technology is breaking down traditional functional regions. Newspapers such as *USA Today* and the *New York Times* are transmitted by satellite to printing machines in various places.

**Vernacular Region.** A vernacular region, or perceptual region, is a place that people believe exists as part of their cultural identity. Such vernacular regions emerge from people's informal perceptions of place, rather than from scientific models. As an example of a vernacular region, Americans frequently refer to the South as a place with environmental, cultural, and economic features perceived to be quite distinct from the rest of the United States.

(23)

### **Spatial Association**

Different conclusions may be reached concerning a region's characteristics depending on scale. For example, death rates vary widely among scales within the United States.

At the national scale, the eastern regions of the United States have higher levels of cancer than the western ones. At the scale of the state of Maryland, the city of Baltimore and counties in the east have higher levels of cancer than the western and suburban counties. At the scale of the city of Baltimore, lower levels of cancer are found in the zip codes on the north side. To explain why regions possess distinctive features, such as a high cancer rate, geographers try to identify cultural, economic, and environmental factors that display similar spatial distributions. Geographers conclude that factors with similar distributions have spatial association.

### **Regional Integration of Culture**

In thinking about *why* each region on Earth is distinctive, geographers refer to **culture**, which is the body of customary beliefs, material traits, and social forms that together constitute the distinct tradition of a group of people. Intellectually challenging culture is often distinguished from *popular culture*, such as television programs. *Culture* also refers to small living organisms, such as those found under a microscope or in yogurt. *Agriculture* is a term for growing things on a much larger scale. The origin of the word *culture* is the Latin *cultus*, which means "to care for," which has two very different meanings.

**Culture.** Some geographers study what people care about (their ideas, beliefs, values, and customs), whereas other geographers emphasize what people take care of (their ways of earning a living and obtaining food, clothing and shelter).

(24)

**What People Care About.** Especially important cultural values derive from a group's language, religion, and ethnicity. Language is a system of signs, sounds, gestures, and marks

that have meanings understood within a cultural group. Religion is an important cultural value because it is the principle system of attitudes, beliefs, and practices through which people worship in a formal, organized way. Ethnicity encompasses a group's language, religion, and other cultural values, as well as its physical traits, products of common traditions, and heredity.

**What People Take Care Of.** The second element of culture of interest to geographers is production of material wealth—the food, clothing, and shelter that humans need to survive and thrive. Different cultural groups obtain their wealth in different ways. Geographers divide the world into regions with countries that are more (or relatively) developed economically (abbreviated MDCs), and regions with less developed (or developing) countries (abbreviated LDCs). Agriculture predominates in LDCs, while manufacturing and performing services for wages predominates in MDCs. Some manufacturing is leaving MDCs and relocating in LDCs. Geographers are also interested in the political institutions that protect material artifacts, as well as cultural values. As discussed in Chapter 8, cultural groups in the modern world are increasingly asserting their rights to organize their own affairs at the local scale rather than submit to the control of other cultural groups.

### **Cultural Ecology: Integrating Culture and Environment**

In constructing regions, geographers consider environmental factors as well as cultural. Cultural ecology is the geographic study of human-environment relations. Some nineteenth century geographers argued that human actions were *scientifically caused* by environmental conditions, an approach called **environmental determinism**. Modern geographers reject environmental determinism in favor of **possibilism**, arguing that the physical environment may limit some human actions, but people can adjust to their environment. People choose a course of action among alternatives in the environment, and endow the physical environment with cultural values by treating it as substances for use, a collection of **resources**. For example, the climate of any location influences human activities, especially food production.

(26)

**Human and Physical Factors.** Human geographers use this cultural ecology, or human-environment, approach to explain many global issues. People can adjust to the capacity of the physical environment by controlling their population growth, adopting new technology, consuming different foods, migrating to new locations, and other actions. A people's level of wealth can also influence its attitudes toward modifying the environment. A rocky hillside is an obstacle to a farmer with a tractor, but an opportunity to a farmer with a hoe. Modern technology has altered the historic relationship between people and the environment.

**Physical Processes: Climate.** Human geographers need some familiarity with global environmental processes to understand the distribution of human activities.

Climate is the long-term average weather condition at a particular location. Geographers frequently classify climates according to a system developed by German climatologist Vladimir Köppen. The modified Köppen system divides the five main climate regions into several subtypes. The climate of a particular location influences human activities, especially production of the food needed to survive.

(24)

**Physical Processes: Vegetation.** Plant life covers nearly the entire land surface of Earth. Earth's land vegetation includes four major forms of plant communities, called biomes: forest,

savanna, grassland, and desert. Their location and extent are influenced by both climate and human activities. Vegetation and soil, in turn, influence the types of agriculture that people practice in a particular region.

**Physical Processes: Soil.** Soil, the material that forms on Earth's surface, is the thin interface between the air and the rocks. Not merely dirt, soil contains the nutrients necessary for successful growth of plants, including those useful to humans.

The U.S. Comprehensive Soil Classification System divides global soil types into ten orders. The orders are subdivided into suborders, great groups, subgroups, families, and series. More than 12,000 soil types have been identified in the United States alone. Two basic problems contribute to the destruction of soil: erosion and depletion of nutrients.

(28)

**Physical Processes: Landforms.** Geographers find that the study of Earth's landforms—a science known as geomorphology—helps to explain the distribution of people and the choice of economic activities at different locations.

Geographers use topographic maps to study the relief and slope of localities. Relief is the difference in elevation between any two points, and it measures the extent to which an area is flat or hilly.

**The Netherlands: Sensitive Environmental Modification.** Few regions have been as thoroughly modified by humans as the Netherlands. More than half of the country lies below sea level. The building of dikes and polders began in the thirteenth century as private enterprise and has been continued by the government during the last 200 years. A polder is created by draining water from an area of land. In the north, a dike built in 1932 has turned the Zuider Zee from a saltwater sea to a freshwater lake. An ambitious 30-year project in the southwest, begun after a devastating flood in 1953, built dams to close off most of the water ways in the huge Delta formed by the Rhine, the Maas, and the Scheldt rivers. With these two massive projects finished, attitudes toward modifying the environment have changed in the Netherlands. The Dutch are deliberately breaking some dikes to flood fields. But modifying the environment will still be essential to the survival of the Dutch.

(29)

**Florida: Not-So-Sensitive Environmental Modification.** The fragile landscape of south Florida has been altered in insensitive ways, especially the barrier islands, the Everglades wetlands, and the Kissimmee River. The barrier islands are essentially large sandbars that shield the mainland from flooding and storm damage.

Despite their fragile condition, the barrier islands are attractive locations for constructing homes and recreational facilities. People build seawalls and jetties to fight erosion, but these projects result in more damage than protection. A seawall causes erosion on the down-current side of the island, by trapping sand along the up-current side. During the late 1940s the Army Corp of Engineers drained the northern third of the Everglades, opening 750,000 acres of land for growing sugarcane. The southern 1.4 million acres became a National Park. To protect the sugarcane fields and southern Florida cities from flooding, the Corps also built an elaborate set of levees, canals, and pumping stations. As a result, most of the freshwater that once reached the southern Everglades was pumped out to sea, and what water did reach the National Park was high in phosphorus, threatening native vegetation and endangering rare



birds and other animals. A 1999 plan called for removing 60,000 acres from sugarcane production and pumping fresh water into the Park, rather than out to sea, but the survival of plants and animals of the Everglades now still depends on sensitive human management of the region's water flow.

The state of Florida asked the Army Corps of Engineers to straighten the course of the Kissimmee River into a canal, because summer flooding rains were an obstacle to cattle grazing and urban growth. After the opening of the canal, polluted water mainly from cattle grazing along the banks ran into the canal and flowed into Lake Okeechobee, which is the source of freshwater for half of Florida's population. The Corps is now spending hundreds of millions of dollars to restore the Kissimmee River to its meandering course and to buy the nearby grazing land, which will again be subject to flooding.

### **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. This section discusses three basic concepts—scale, space, and connections—that help geographers understand why two places or regions can display similar features.

(31)

#### **Scale: From Local to Global**

All scales from local to global are important in geography—the appropriate scale depends on the specific subject. At a local scale, such as a neighborhood within a city, geographers tend to see unique features. At the global scale, encompassing the entire world, geographers tend to see broad patterns. Geography matters in the contemporary world because it can explain human actions at all scales, from local to global.

#### **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.

A few people living in very remote regions of the world may be able to provide all of their daily necessities. But most economic activities undertaken in one region are influenced by interaction with decision makers located elsewhere. Globalization of the economy has been led primarily by **transnational corporations**, sometimes called multinational corporations. Modern technology provides the means to easily move money—as well as materials, products, technology, and other economic assets—around the world. Every place in the world is part of the global economy, but globalization has led to more specialization at the local level.

A locality may be especially suitable for a transnational corporation to conduct research, to develop new engineering systems, to extract raw material, to produce parts, to store finished

products, to sell them, or to manage operations. Globalization of the economy has heightened economic differences among places.

(32)

### **Globalization of Culture**

Geographers observe that increasingly uniform cultural preferences produce uniform "global" landscapes of material artifacts and of cultural values. The survival of a local culture's distinctive beliefs, forms, and traits is threatened by interaction with such social customs as wearing jeans and Nike shoes, consuming Coca-Cola and McDonalds hamburgers, and other preferences in food, clothing shelter, and leisure activities. Yet despite globalization, cultural differences among places not only persist but actually flourish in many places. The communications revolution that promotes globalization of culture also permits preservation of cultural diversity.

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. Culturally, people residing in different places are displaying fewer differences and more similarities in their cultural preferences. But the desire of some people to retain their traditional cultural elements has led to political conflict and market fragmentation in some regions.

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. Human geographers understand that many contemporary social problems result from a tension between forces promoting global culture and economy on the one hand and, on the other, preservation of local economic autonomy and cultural traditions.

(33)

### **Space: Distribution Features**

Geographers think about the arrangements of people and activities found in space and try to understand why those people and activities are distributed across space as they are.

#### **Distribution**

The arrangement of a feature in space is known as distribution. Geographers identify three main properties of distribution across Earth: density, concentration, and pattern.

**Density.** The frequency with which something occurs in space is its density. **Arithmetic density**, which is the total number of objects in an area, is commonly used to compare the distribution of population in different countries. Arithmetic density involves two measures: the number of people and the land area. A large *population* does not necessarily lead to a high *density*. **Physiological density** is the number of persons per unit of area suitable for agriculture. The number of farmers per unit of area is called **agricultural density**. **Housing density** is the number of dwelling units per unit of area.

**Concentration.** The extent of a feature's spread over space is the concentration. *Clustered* objects in an area are close together, *dispersed* are far apart. Geographers use concentration to describe changes in distribution.

(35)

**Pattern.** Some features are organized in a geometric pattern, while others are distributed irregularly.

### **Gender and Ethnic Diversity in Space**

Spatial interaction may be limited even among people in close proximity to one another. Consider first the daily movement of an "all-American" family.

Dad drives to work, spends the day and drives home. The mother's local-scale travel patterns are likely to be far more complex than the father's, as she transports children and organizes family life. 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. If the hypothetical family consisted of persons of color, its connections with space would change. In most U.S. neighborhoods the residents are virtually all whites or virtually all persons of color. Segregation persists partly based on cultural preference, partly based on fears.

Cultural identity is a source of pride to people at the local scale and an inspiration for personal values. Even more than self-identification, personal traits matter to other people. For geographers, concern for cultural diversity is not merely a politically correct expediency; it lies at the heart of geography's spatial tradition.

(36)

### **Connections between Places**

Geographers apply the term space-time compression to describe the reduction in the time it takes for something to reach another place. 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. Today travel by motor vehicle or airplane is much quicker and we can communicate instantly with people in distant places. When places are connected to each other through a network, geographers say there is spatial interaction between them.

Networks are chains of communication that connect places. A well-known example is the television network. Transportation systems also form networks that connect places to each other. Typically, the farther away one group is from another, the less likely the two groups are to interact. This trailing-off phenomenon is called distance decay.

(38)

### **Diffusion**

Diffusion is the process by which a characteristic spreads across space from one place to another over time. The place from which an innovation originates is called a hearth. The dominant cultural, political, and economic features of contemporary United States and Canada can be traced primarily to hearths in Europe and the Middle East. Other regions of the world also contain important hearths. An idea, such as agriculture, may originate independently in more than one hearth. Geographers observe two basic types of diffusion: relocation and expansion.

**Relocation Diffusion.** The spread of an idea through physical movement of people is termed relocation diffusion. Relocation diffusion can explain the rapid rise in the number of AIDS cases in the United State during the 1980s and early 1990s but not the rapid decline beginning in the mid-1990s. The decline resulted from the rapid diffusion of preventive methods and medicines. 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, contagious diffusion, (and) stimulus diffusion. **Hierarchical diffusion** is the spread of an idea from persons or nodes of authority or power to other persons or places. **Contagious diffusion** is the rapid, widespread diffusion of a characteristic throughout the population: **Stimulus diffusion** is the spread of an underlying principle, even though a characteristic itself apparently fails to diffuse. Modern methods of communications . . . encourage . . . hierarchical diffusion. The Internet . . . has encouraged . . . contagious diffusion. All the new technologies support . . . stimulus diffusion.

(40)

**Diffusion of Culture and Economy.** In a global culture and economy, transportation and communications systems have been organized to rapidly diffuse raw materials, goods, services, and capital from nodes of origin to other regions. The global culture and economy is increasingly centered on three core or hearth regions of North America, Western Europe, and Japan. 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 . . . is known as **uneven development**.

### Key Terms

Agricultural density (p.34)  
 Arithmetic density (p.34)  
 Base line (p.12)  
 Cartography (p.6)  
 Concentration (p.34)  
 Connections (p.5)  
 Contagious diffusion (p.40)  
 Cultural ecology (p.25)  
 Cultural landscape (p.20)  
 Culture (p.24)  
 Density (p.34)  
 Diffusion (p.38)  
 Distance decay (p.37)  
 Distribution (p.34)  
 Environmental determinism (p.25)  
 Expansion diffusion (p.38)  
 Formal region (p.20)  
 Functional region (p.22)  
 Geographic Information System (GIS) (p.14)  
 Global Positioning System (GPS) (p.14)  
 Globalization (p.31)  
 Greenwich Mean Time (p.19)

Hearth (p.38)  
 Hierarchical diffusion (p.39)  
 International Date Line (p.20)  
 Land Ordinance of 1785 (p.12)  
 Latitude (p.18)  
 Location (p.15)  
 Longitude (p.18)  
 Map (p.5)  
 Mental map (p.22)  
 Meridian (p.18)  
 Parallel (p.18)  
 Pattern (p.35)  
 Physiological density (p.34)  
 Place (p.5)  
 Polder (p.28)  
 Possibilism (p.26)  
 Prime meridian (p.18)  
 Principal meridian (p.12)  
 Projection (p.12)  
 Region (p.5)  
 Regional studies (p.20)  
 Relocation diffusion (p.38)  
 Remote sensing (p.14)

Resource (p.26)  
Scale (p.10)  
Section (p.12)  
Site (p.16)  
Situation (p.16)  
Space (p.5)  
Space-time compression (p.36)

Stimulus diffusion (p.40)  
Toponym (p.15)  
Township (p.12)  
Transnational corporation (p.31)  
Uneven development (p.40)  
Vernacular region (p.22)