Electronic communications, such as the Internet and e-mail, have removed barriers to interaction between people who are far from each other. The birth of these electronic communications was initially 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 on-line the specific place in the world where the individual is located is known. This information is valuable information for businesses who 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.

As discussed in subsequent chapters, geographers can trace the dominant cultural, political, and economic features of contemporary United States and Canada primarily to hearths in Europe and the Middle East. However, 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 twelve Western Europe countries gave scientists an unusual opportunity to measure relocation diffusion from hearths. Although a single set of paper money was issued, each of the twelve 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 can also be used in the other eleven countries. Dutch scientists took month-to-month samples to monitor the proportion of coins from each of the other eleven countries. The percentage of coins from a particular country is a measure of the level of relocation diffusion to and from the Netherlands.

The process of 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 1–22). 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 focal points. 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 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:

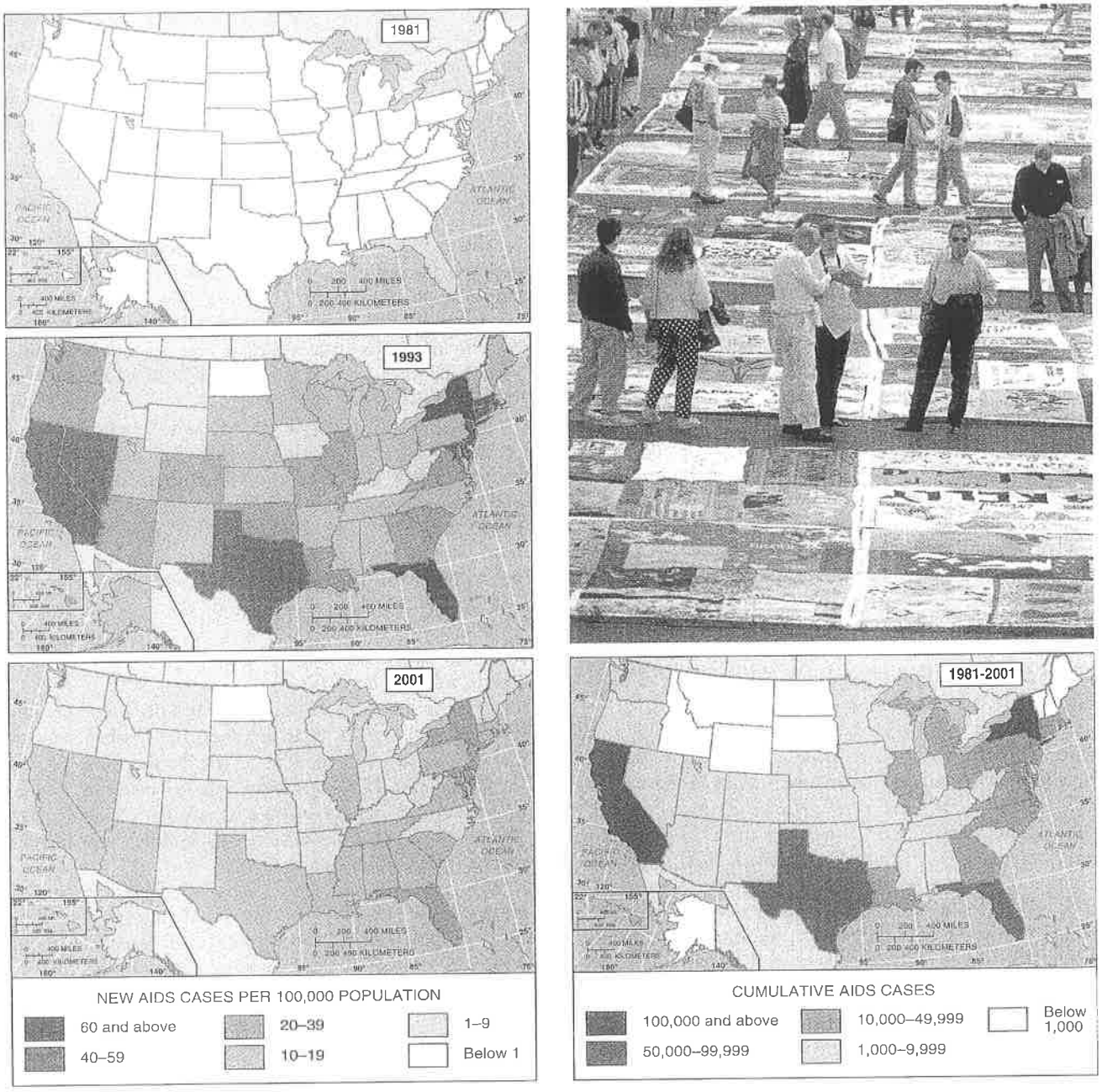

FIGURE 1–22 *Diffusion of AIDS in the United States. Acquired immunodeficiency syndrome (AIDS) diffused across the United States from nodes in New York, California, and Florida. In 1981 virtually all people with AIDS were found in these three nodes. During the 1980s the number of cases increased everywhere, but the incidence remained highest in the three original nodes. The number of cases declined relatively rapidly in the original nodes during the 1990s. The AIDS Memorial Quilt, on display in Washington, DC, was assembled as a memorial to people who have died of AIDS.*

- hierarchical diffusion
- contagious diffusion
- stimulus diffusion

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. Ideas placed on the World Wide Web spread 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 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. Modern methods of communications, such as computers, facsimile machines, and electronic mail systems have encouraged more rapid hierarchical diffusion than in the past. The Internet, especially the World Wide Web, has encouraged more rapid contagious diffusion. All the new technologies support the possibility of stimulus diffusion. 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 have been organized to 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.

The global culture and economy is increasingly centered on 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 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 family, 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.