The past decade has seen extraordinary, rapid changes in political, social, and environmental arrangements. The Cold War order has come to an end, ethnic conflicts have intensified in many places, and we increasingly read about the myriad ways in which humans are altering the environment. In the midst of these developments, policymakers and scholars are scrambling to find new ways of making sense of the world—and a growing number of them are looking to geographical concepts and tools in the process. They are seeking insight into how things are organized and relate to one another on the surface of the Earth; they are using geographic information systems (GISs) to study the relationship among spatial data; and they are asking questions about the importance of "location," "place," and "region" in human affairs. Why is geography so much a part of the effort to come to terms with our rapidly changing world? What does it mean to think geographically? Can geography offer insights into the diversity of changes unfolding around us?

Green and gold in the skyline of a city with a high-tech hinterland: San Francisco.
Chapter 1

Geography and Human Geography

From the field notes

"Along the road north from Colombo, capital of Sri Lanka, on the way to Kandy, every square foot of level land, natural or (terraced) artificial, seems to be devoted to the cultivation of rice. The rich, well-watered soil yields bountiful crops, but farming methods remain labor-intensive. I stopped here to watch about 20 workers unwrap the bundles of shoots and plant them in the muddy paddy. Standing in the waterlogged soil, bent over almost without letup, they filled the paddy with amazing dexterity and speed; soon they moved to the waiting field in the foreground, where the bundles were already waiting. It is a scene repeated countless times in much of tropical Asia, where a majority of the population remains rural and where survival depends directly on what the paddies can produce."
**KEY POINTS**

- Geography offers fundamental insights into the world in which we live through its concern with the spatial organization and character of the Earth’s surface.
- Physical and human geography are two great branches of the discipline, but environmental geography is emerging as a link between the two.
- Geography’s spatial perspective promotes a focus on location, interaction between humans and the environment, regions, place, movement, and landscape.
- The use of maps and Geographic Information Systems reflects the centrality of a spatial perspective to geography.
- Maps are used to portray the distinctive character of places; their relationship to environmental issues; the movements of people, goods, and ideas; and regions of various types.
- People’s perceptions of places and regions are influenced by their individual mental maps as well as by printed maps.

Geography is at the very heart of the human experience. For many people, place of birth is one of the most powerful determinants of a lifetime’s experiences. Even in the modern era of migration and travel, global interaction, and mass communication, the vast majority of people do not move far beyond their places of birth, and even those who do are influenced by where they were born. The first language you learn, the first foods you eat, the first religion of which you become aware, the first clothing with which you become comfortable—all these, and much else, are associated with your birthplace.

Yet this is only the beginning. How and where you move through life, the people you meet, and what you are able to see and acquire are all tied to geography—for each of these is fundamentally influenced by the character of the places you encounter and by the human and environmental patterns that make up our world. We now live in an age of increasing globalization. Peoples and economies throughout the world are interconnected as never before. Nevertheless, our world still encompasses a jigsaw of countries and important places are located is useful, but it is only a beginning, a bit like knowing some introductory vocabulary when you start studying a foreign language. Knowing why places and people are where they are, what their location means in the past, present, and future, and how their location affects other places—understanding matters such as these brings us much closer to knowing what geography is about.

Note that we just referred to places and people. This book is mainly about places and their human inhabitants. It also deals with how the world has become organized, and in many places transformed, by human activity. But make no mistake: there is more to geography than human geography. The other half of geography is termed physical geography. Actually, a more precise name for this subdiscipline might be natural geography because it deals not only with mountains, glaciers, coastlines, and climates but also with soils, plants, and animals. As we will see, it is often difficult to discuss human geography without also referring to the physical stage on which the human drama is being played out. Indeed, so many contemporary issues occur at the intersection of human and physical geography that environmental geography is emerging as a third basic subdivision of geography. However, in this book our focus will be on human geography. Although it represents only part of the discipline, human geography encompasses several subfields (Fig. 1-1). Each of these has an environmental component that connects it to the domains of physical and environmental geography.
The Common Bond: A Spatial Perspective

If geography deals with so many aspects of our world, ranging from people and places to coastlines and climates, what do the various facets of this wide-ranging discipline have in common? The answer lies in a term that often is used most effectively as an adjective: spatial. Whether they are human geographers or physical geographers, virtually all geographers are interested in the way places and things are laid out, organized, and arranged on the surface of the Earth. Sometimes a particular spatial arrangement of human activities or conditions leads geographers to raise questions as to how this arrangement has come about, what processes create and sustain particular patterns, and what relationships exist between different places and things. In such instances, the spatial pattern already is evident, and the search is on for an explanation. But in other cases the spatial arrangement may not be evident at all and must be discovered before it can lead to answers. As we will see in our discussions of medical geography, for example, the mapping of the distribution of people afflicted by certain illnesses led researchers directly to the sources of the illnesses and thus to remedies for them.

Medical geography is just one part of human geography in which spatial analysis has practical application. Yet another interest of geographers is the impact of particular spatial patterns on some process or idea. Political geographers, for example, are interested in how the division of the world into discrete countries influences everything from concepts of nationality—"I am a German, Russian, Pole"—to how environmental issues are understood and addressed.

Like their human geographer counterparts, physical geographers are also concerned with the spatial organization of the planet. Early in the twentieth century a climatologist, Alfred Wegener, became convinced after extended observation that the jigsaw-like fit of the continental landmasses on opposite sides of the North and South Atlantic oceans could not be a matter of chance. He marshaled a vast array of geographical and geological evidence, most of it spatial in nature, and on the basis of this evidence he proposed a hypothesis of continental drift. His theory was that the continental landmasses were once united as a giant supercontinent that later broke apart. Wegener’s geographic hypothesis, based on the spatial layout of the physical world he knew so well, set the direction for the geological research that was to lead (a half century...
later) to the discovery of plate tectonics and crustal spreading, the mechanism that drives the continents apart.

Human and physical geographers thus share this spatial perspective, this way of looking at the world’s—and the Earth’s—layout. So the language of geography is not only the language of places and people but also a whole vocabulary of spatial terms, many of which will become familiar (though occasionally from a new viewpoint) as we proceed. We have already used some of these terms: location is one, and pattern and distribution are others. In due course we will become familiar with others, making geographic communication in the pages that follow not only easier but also more efficient and accurate.

The important point here is that we cannot hope to understand the complexity and diversity of our planet if we do not think geographically. No amount of information about the workings of the Russian government can provide insight into the future of the Russian state if we do not understand the distribution of ethnic groups in and around Russia and their differing ideas about territory and place. And no amount of analysis of data on trade among the countries in the countries in the Pacific Asia can provide a sense of the economic challenges facing the region if we do not consider the patterns of advantage and disadvantage within individual countries. In short, geography is indispensable to an appreciation of who we are, where we came from, and where we are going.

THE NATURE AND IMPORTANCE OF GEOGRAPHIC INQUIRY

What does it mean to look at the world from a geographic perspective? Much more than many people seem to think. Those with little understanding of geography sometimes treat it as an exercise in place-name memorization. If you know where things are on a map, you are said to be geographically literate. Yet no one would claim that someone has a deep knowledge of history just because they know the dates of major events. Instead, to understand history is to appreciate how events, circumstances, and ideas came together at particular times to produce certain outcomes. And a knowledge of how things have developed over time is thought to be critical to understanding who we are and where we are going.

If a concern with understanding change over time is of critical importance, wouldn’t it make sense that understanding change across space would be of importance as well? This was the view of the great German philosopher, Immanuel Kant, who argued that we need disciplines focused not only on particular phenomena (economics, sociology, etc.), but on the perspectives of time (history) and space (geography) as well. Following this view, history and geography can be understood as disciplines that have intellectual cores defined not so much by subject matter as by perspective. Returning to Figure 1-1, human geography can be seen as a meeting point of a variety of disciplines not because it covers the turf of all those disciplines, but because it offers insights into subject matter covered by those disciplines by bringing a spatial perspective to bear. Just because a spatial perspective is at the core of geography does not mean that time is a matter of concern only for historians, however. Geography is often at its most powerful when it seeks to understand changing spatial arrangements over time, just as history can make sense of the world only if space is taken into consideration.

Whatever their differences and points of overlap, a clear commonality between history and geography is their concern with explanation. Knowing when things happened may be a first step toward historical understanding, but real understanding requires an appreciation of why and how things came together at certain times to produce particular outcomes. Adopting a similar approach, the well-known cultural geographer Marvin Mikesell has defined geography in shorthand as the ‘why of where.’ Why and how do things come together in certain places to produce particular outcomes? Why are some things found in certain places but not in others? To what extent do things in one place influence those in other places? Questions such as these are at the core of geographic inquiry—and they are of critical importance in any effort to make sense of our world. They help explain why geography has become a core intellectual concern in major universities around the world. They also reveal why efforts are being mounted to enhance geography’s role in education and research in the United States.

During the 1980s, when concern about geographic illiteracy in the United States was growing, several organizations began campaigns to reintroduce geography into school curricula. Leading these campaigns was the Geography Education National Implementation Project (GENIP)—an initiative of the four major U.S. geographical organizations. The National Geographic Society published the results of their work in a document entitled Maps, the Landscape, and Fundamental Themes in Geography (1986), which introduced “Five Themes” of geography. Several million copies of the publication were disseminated to schools throughout the United States, and the “Five Themes” became, for many students, an introduction to the perspectives of geography.

Geography’s Themes and Perspectives

It is worth considering the themes proposed by the GENIP initiative, for they provide insight into what lies behind geography’s spatial emphasis. The first theme, location, highlights how the geographical position of
people and things on the Earth’s surface affects what happens and why. A concern with location underlies almost all geographical work, for location helps to establish the context within which events and processes are situated. Some geographers seek to develop elaborate (usually quantitative) models describing the locational properties of particular phenomena—and even predicting where things are likely to occur. Such undertakings have fostered an interest in location theory, an element of contemporary human geography that seeks answers to a wide range of questions—some of them theoretical, others highly practical: Why are villages, towns, and cities spaced the way they are? Given a market of a certain size and wealth, where in the surrounding countryside should particular products be grown or raised? What would be the best location for a new shopping center or medical facility, given existing settlement patterns, road networks, and the like?

A spatial perspective invites consideration of the relationship among phenomena in individual places—including the relationship between humans and the natural world. Thus, the second of the ‘Five Themes’ identified by GENIP concerns human–environment interactions. How do different culture groups understand, use, and transform their environments? And how does environment influence human activity? Many years ago, some geographers were tempted to generalize about the impacts of the natural environment (mainly climate) on the technological development of societies—concluding that the natural environment played the most important role in determining whether and how human societies progressed. As we will see, this led to assumptions about predictable advantages and disadvantages of different environments, which were both highly controversial and misused by demagogues. The result is that most geographers turned away from work on the role of environment in human affairs. Yet societies and cultures are situated in physical-environmental contexts that necessarily influence important aspects of what they do—a point that is increasingly recognized in the wake of more general concerns about human-environment interactions. Armed with new, nondeterministic perspectives, geographers are now making fundamental contributions to an understanding of the interrelationships between humans and the environments in which they live and work.

The third highlighted theme of geography is that of the region. Phenomena are not evenly distributed on the surface of the Earth. Instead, features tend to be concentrated in particular areas, which we often think of as regions. And throughout history, humans have divided up the surface of the Earth into regions in their struggles to organize political, economic, and social activity. The character and location of regions is thus a critical element of the Earth’s geography—not simply reflecting particular geographic concentrations, but influencing how they change over time.

Geographers have long sought to develop insightful descriptions of different regions of the Earth. More recently, efforts to develop formal approaches to the delimitation and analysis of regions led to the development of regional science—an undertaking that involves the application of modern quantitative spatial-analytic techniques to regional questions. In whatever form it exists and whatever it is called, regional study will survive as one of the central traditions of geography. James Michener once wrote that whenever he started writing a new book, he first prepared himself by turning to books written by regional geographers about the area where the action was to occur. Geography’s regional dimension is, indeed, one of its permanent traditions.

In addition to the foregoing traditional themes, the National Geographic Society’s publication identified two others. The fourth theme is represented by the seemingly simple word place. All places on the surface of the Earth have distinguishing human and physical characteristics, and one of the purposes of geography is to study the special character and meaning of places. Indeed, human understanding of the Earth’s diversity is often from the field notes.

"On the main street of Dalian, Northeast China, I watched this artist create an image full of symbolism: the computer in the land (and the hand) of the Manchus. This was no mass-produced billboard. He had painted these images on large sheets of paper, had pasted these up, and was now adding the finishing touches. I pointed to the computer and asked if he knew how to use it. He shook his head, grabbed a paint brush, and pointed it to himself. But his work symbolized the importance of understanding the diffusion of ideas from one place to another in our ever-more interconnected world."
rootted in place, so a focus on this concept is critical to bringing human experience into the geographic picture. The fifth theme, movement, refers to the mobility of people, goods, and ideas across the surface of the planet. Interactions of many kinds shape the human geography of the world, and understanding these is an important aspect of the global spatial order.

Although not specifically highlighted by GENIP as one of the core themes of geography, one other concept figured in the committee’s work and is widely seen as a core element of geography: landscape. Geographers use the term landscape to refer to the material character of a place—the complex of natural features, human structures, and other tangible objects that give a place a particular form. Human geographers look to landscape both to obtain clues into the processes that create individual places and to understand how the form of a place shapes the ideas and interactions of those who inhabit it.

A concern with landscape is fundamental to a spatial perspective because landscapes are the product of particular spatial convergences. The landscape of the Mississippi delta reflects the convergence of different cultural, social, economic, and political influences in a particular place, as well as the interaction of those influences with the natural environment. As such, the landscape can be read as a text offering insights into the character of places. Why are areas of high population density so often areas with good arable land? How does the configuration of the street pattern in a particular suburb affect the location of retail establishments? How do the distinctive social, cultural, political, and environmental characteristics of a town or region shape its character as a place? Questions such as these are all tied to the quest to understand integration in place.

Geography’s interest in interdependencies between places reflects its focus on the nature and significance of the patterns and networks that tie places together. How did migration out of southeastern Europe in the 1990s affect the relationship of parts of Western Europe to the Balkans? What impact is the Internet having on the ability of people in one place to influence those living in another? How has the European integration project altered the relationships among peoples located on either side of international boundaries? These questions are illustrative of a concern with interdependencies between places.

An emphasis on the nature and significance of interdependencies among scales is tied to geography’s spatial perspective. It is impossible to understand the character of most places or spatial patterns without considering the role of arrangements and processes operating at different scales. For example, the location and character of an immigrant neighborhood within a city is not just the
Geographers examine places and patterns at a variety of scales, from local to regional to global. Indeed, geography’s concern with space puts scale at the center of its agenda. After all, the very process of examining and mapping a phenomenon involves making choices about scale. The things one might say about the distribution of French speakers will change depending on whether one looks at that distribution throughout the world, in Europe, in France, or in a Paris neighborhood. And geographers’ sensitivity to scale leads them always to question what is revealed and what is hidden when a generalization is made about a people or a place at a particular scale.

The geographer’s concern with scale goes beyond an interest in the scale of individual phenomena to a concern with how processes operating at different scales influence one another. If one is to understand the conflict between the Tutsi and the Hutu people in Rwanda, for example, one cannot look solely at this small African country. That conflict is influenced by developments at a variety of different scales, including patterns of migration and interaction in Central Africa, the economic and political relations between Rwanda and parts of Europe, and the variable impacts of globalization—economic, political, and cultural. The extent to which phenomena at one scale are influenced by those at other scales is so great that some scholars talk about a “local-global continuum.”

It is impossible for a single text to cover all the complexities of the local-global continuum. We have therefore chosen to focus on the global and regional scales, both because this book is designed as an introductory survey of the field and because an understanding of developments at larger scales is critical to an appreciation of what is happening at smaller scales. Nevertheless, it is important to understand that influences flow not just from top to bottom, but in the other direction as well, and we talk about some of these in the book. It is also important to recognize that the tools of inquiry that we employ in this book can be employed at smaller scales as well: population can be mapped and analyzed in a neighborhood, cultural landscapes can be studied in a village, and the environmental impacts of agriculture can be studied in a watershed. To help highlight this point, the Sense of Scale boxes scattered through the text highlight local manifestations of larger-scale phenomena and show how developments at one scale influence those at another scale.

Geography’s Importance

The National Research Council’s interest in the current status of geography reflects growing recognition of the insights to be gained from a focus on the spatial organization and material character of the Earth’s surface. Can we really hope to develop sensible trade policies if we do not understand changing patterns of economic interaction among peoples? How can we prepare individuals for intelligent participation in a democratic society without providing them with an understanding of the impacts of changing political boundaries on citizenship and governance? What progress can we make in researching biodiversity loss if we do not understand the pressures on tropical rainforests resulting from different patterns of human activity? Geography’s importance is revealed in the obvious answers that each of these questions elicits.

Against this backdrop, it will not surprise you to know that geographers (although often too few of them!) are employed by universities, research institutes, laboratories, public agencies, and private businesses to work on issues of contemporary relevance and concern. For example, geographers study where medical facilities should be located to benefit the largest number of people, they research why states are fighting over particular territories, they investigate why some areas are becoming richer while others are becoming...
poorer, and they develop land-use maps designed to minimize the negative environmental impacts of development. Their work often looks backwards as well so that we can better understand how the world got to be the way that it is.

Geography also can be forward looking. What do changing demographic trends in different regions suggest about the population issues countries will be facing in the middle of the twenty-first century? What does the growing use of English portend for the linguistic diversity of the planet? What are the likely implications of the acceleration of rural-to-urban migration for the character of human settlement in the decades to come? Each of these is a geographic question that helps crystallize the issues that will shape our world in the years and decades to come. We will focus on such matters in a series of “Looking Ahead” boxes at the end of each part of this book. The goal is to see how human geography can shed light on the world that is coming into being.

◆ USING THE SPATIAL PERSPECTIVE

There is no better way to demonstrate the insights gained through spatial analysis than through the use of maps. Maps are an incredibly powerful geographic tool, and mapmaking is as old as geography itself (For details on cartography, see Resource A at the end of this book.) Maps are used to wage war, to make political propaganda, to solve medical problems, to locate shopping centers, to bring relief to refugees, to warn of natural hazards—in short, for countless purposes.

We have already seen that the theme of location is fundamental to geography. Maps tell us where places are located in relation to other places. However, there is more to this statement than first meets the eye. True, maps provide the locations of places in terms of the Earth’s latitude-longitude grid, but it really means very little to know that Chicago lies at 41 degrees, 53 minutes North Latitude and 87 degrees, 38 minutes West Longitude. Those data identify Chicago’s absolute location—its location in relation to a neutral, agreed-upon frame of reference. They become interesting when compared to other absolute locations, but for our purposes they are not useful for much else. By checking a map, we can determine that Chicago lies approximately at the same latitude as Madrid, Spain, and Beijing, China, and (this may surprise you) at the same longitude as the Galapagos Islands in the Pacific Ocean. So the coordinates of absolute location are useful mainly in determining exact distances and directions.

The relative location of a place is a very different matter. This is its location relative to other human and physical features on the landscape. Where does Chicago lie in relation to Lake Michigan, its important waterway; to Milwaukee, its not-too-distant neighbor; to the mineral resources and farmlands of the Midwest; or to the road and railroad networks? All of these could be represented on maps. Note that a vast system of roads and railroads converges on Chicago from all parts of the surrounding region (Fig. 1-3). This means that the city’s interconnections with the region around it are exceptionally efficient. Whether you wanted to distribute something from Chicago to the four states that lie within 60 miles (100 kilometers) of it, or reach the Chicago market from someplace in the region, surface communications are readily available. What the map does not show is Chicago’s role as a hub of airline transportation. As urban geographers (those who study the spatial organization and landscapes of cities) say, Chicago has great centrality. Centrality is a function of location, relative to other
urban places, resources, productive farmlands, and efficient transport linkages.

Whereas the absolute location of a place does not change, its relative location is subject to constant modification. From its beginning, Chicago was an important city in the interior of North America, but its relative location changed markedly in 1959 when the St. Lawrence Seaway was opened and the city acquired a direct maritime connection to the North Atlantic Ocean. Although the seaway closes in the winter when ice blocks navigation, Chicago can be reached by oceangoing vessels throughout the rest of the year. As an inland port, its relative location has changed substantially. Ships that could once get no closer than the eastern ports of North America now dock in sight of Chicago’s downtown skyline.

An especially dramatic change in relative location has affected an entire country, Japan, during the past century. As late as the mid-nineteenth century, Japan was relatively isolated from the developing global economy. When the Japanese decided to embark on the road to industrialization, they chose Britain as their model (which is why they still drive on the left side of the road).

However, Japan was half a world removed from Europe, the center of the industrial world at the time. Then during the twentieth century, the United States became the world’s most important industrial power, and now Japan lay directly across the Pacific from the newly dominant American market. Today, Japan’s relative location is changing again as China, right across the East China Sea, becomes a growing trading partner and Russia beckons from across the Sea of Japan. In relative location Japan thus has gone from remote isolation to global hub—but its absolute location has never changed!

♦ THE ROLE OF MAPS IN HUMAN GEOGRAPHY

One of the ways geographers can gain a better understanding of places and issues is by comparing spatial data. Frequently, these comparisons make use of geographic information systems (GISs), a powerful new tool that allows geographers to combine layers of spatial data in a computerized environment, creating maps in which patterns and processes are superimposed. GISs...
Maps demonstrate a vital rule of geography: that places on the Earth have their own distinctive properties which, taken together, give each place its own character. No place is exactly like another, and a map is the best way to demonstrate this. Geographers study both the physical and human properties of places. The Earth’s surface, its elevation and relief, slopes and drainage, soils, natural vegetation, and atmospheric conditions (climate and weather) form the physical setting. The uses to which people put this setting—in the form of settlement layout, population patterns, transport networks, land use, and other activity—create the human imprint. Together, these physical and human features constitute the overall geographic character of a particular place.

Geographers therefore have a special interest in the quality of places. Whether it’s a fishing village on China’s coast or a bustling Arab town, geographers want to know how the people have implanted their traditions on that locale, why they have done so, what sustains them now, and how they interact with the outside world. It is impossible, of course, to study all these aspects at once, so geographers tend to specialize in certain features of places. Some study the street layout and architecture of a town; others concentrate on the transport systems that serve it; still others focus on the business and industry that sustain the local economy. In the process, a kind of geographic overview of the place emerges. If you were to become a professional geographer and found yourself
assigned to study, say, the growth of suburbs around Santiago, the capital of Chile, you would first read what geographers (and others) have already written about that city. With the many specialized maps they have prepared, you would be well informed before you ever set foot in the field.

Maps and Environmental Issues
Throughout this book the theme of human interaction with the environment emerges time and again. Human geography, whether economic, political, urban, or cultural, cannot be studied without reference to the environment in which the action takes place. In the course of our journey, we will look at maps of “acid rain” distribution, deforestation, river basins, ice ages, and other aspects of the natural environment. Some of these maps will raise as many questions as they answer. For example, if Bangladesh faces certain disaster from cyclones that can kill hundreds of thousands, why do people continue to inhabit low-lying ground in the most dangerous areas? Is the southward spread of the Sahara in West Africa a natural phenomenon, or are human groups and their livestock responsible for this devastating process? If the Amazonian rainforest in Brazil and adjacent countries continues to be destroyed at present rates, what will happen to rainfall patterns there?

In Part One we will take a closer look at past and present global environments, but it is useful now to consider a map of one vital ingredient of our Earthly existence: water. Figure 1-5 is a map of the mean annual precipitation around the world. Note the prevalence of dry conditions over much of the globe, from inner Asia to western Africa to central Australia. As the Earth’s human population grows, the demands on this limited supply of water also increase. Drought-caused famines have struck many vulnerable areas, including the northeastern corner of South America, the southern margins of the Sahara in Africa, and south-central Asia. Often such death-dealing droughts cause people to seek relief elsewhere, creating migration streams that cause further dislocation in neighboring zones. For example, thousands of people and their livestock, fleeing from the last drought in West Africa, migrated southward into the moister savanna lands of coastal countries. Their cattle trampled crops and destroyed harvests, and the result was armed conflict between the local farmers and the migrants.

Water shortages are not confined to desert-edge grazing lands in remote corners of the world. Water rationing became a fact of life in California in the early 1990s, yet people continue to move not only into California but also into other water-deficient areas of the American Southwest. As Figure 1-5 suggests, the prospects for water supply in a burgeoning world are worrisome. Expensive desalination plants, using ocean water, modeled after those on the Arabian shore of the Persian Gulf, are making their appearance in California. But their capacity is a drop in the proverbial bucket. The map of world precipitation also emphasizes the importance of the Atlantic Ocean. Note that except for South Asia and Southeast Asia, the moistest areas of the world lie clustered against Atlantic shores, from water-warmed Western Europe to Amazonian South America and from the southeastern United States to West and Equatorial Africa. These regions owe most of their annual water supply to the Atlantic Ocean, whose slowly circulating waters bring warmth and moisture to areas from Britain to Brazil. Even the peaks of the Andes Mountains in western South America; and the densely populated highlands of eastern Africa, get most of their snow and rain not from the neighboring Pacific and Indian oceans but from the faraway Atlantic. Here again we see that a map can tell far more than mere distribution.

Field observation can provide many insights into the Earth’s changing environment, but to understand the scale and rate of environmental change it is often necessary to monitor the Earth’s surface from a distance using modern technology. Remote sensing is thus an important geographic technique. Remote sensing data collected by satellites and aircraft (airplanes, balloons, etc.) reveal both physical changes, such as the extent of flooding in the Mississippi River Valley, and changes that are more directly due to human activity, such as deforestation in the Brazilian Amazon resulting from agricultural activities. More recently, the establishment of a satellite-based global positioning system (GPS) has allowed us to locate things on the surface of the Earth with extraordinary accuracy. Not only does this permit locational data to be collected more quickly and easily in the field, but GPS units also have more mundane uses, such as helping lost campers find their way out of the woods.

Maps and Human Mobility
It is one thing to map static features, such as existing patterns and distributions or the locations of cities and towns, but it is quite another to represent movement on the map. Yet movement is a central theme of geography. Whether it is the movement of goods from factories to markets, the flow of oil from Middle Eastern wells to American consumers, or the migration of people from one region to another, movement must be recorded on maps and interpreted.

To indicate movement, cartographers use many symbols. For example, you can represent the number of travelers on key highways or major airline routes using arrows of varying width; the widths of the arrows reveal...
the comparative quantities of traffic (Fig. 1–6). Such maps show at a glance the intensity of movement along certain routes, and more careful examination reveals the actual numbers or volumes involved.

But there are times when it is not so much the actual volume but the direction of movement that matters most. Where money flows, for example, can be just as important as how much money is moving out of a particular place. More often it is the movement of ideas, notions, and innovations that matters, but such movement cannot be quantified. The geographic term for this is diffusion, the spread of ideas or knowledge from their origins to areas where they are adopted. Much as we would like to, we cannot always measure such diffusion quantitatively, but we can trace its direction. So some maps representing this process have arrows that reflect direction only, not volume.

Maps showing movement of various kinds are among the most interesting in geography. In the chapter on medical geography, you will find a series of maps with arrows showing the routes of invasion of cholera, a dreaded illness of the nineteenth century, which occasionally reappears today. At its height over 100 years ago, no one knew what caused cholera; hundreds of thousands of people died of it. But others were somehow spared. As it turned out, a map was the key to dis-
covering the answer, and a medical geographer solved the problem. Today, similar efforts are being made to combat AIDS, another dreaded disease affecting millions. And again medical geographers are using maps to help.

**Regions on the Map**

Throughout this book we will use regions, and the regional concept, to clarify what is being discussed. Actually, we use some form of the regional idea all the time, even in everyday conversation. When you plan a vacation in “the Rockies,” or a hiking trip in New England, or a cruise in the Caribbean, you are using regional notions to convey what you have in mind. Regions, used this way, serve as informal frames of reference.

In geography, the regional concept is, of course, more specific. To refer to “the Rockies” as a perceived region summarizes what is prominent about this region: steep slopes, dramatic mountain scenery, snowcapped peaks, and ski slopes. But as a geographer you might be asked to define and delimit a Rocky Mountains region. Exactly where are the boundaries of “the Rockies”? In some places, the answer is easily found as the mountains rise suddenly from the adjacent Great Plains (another region). Elsewhere, however, the mountainous terrain rises gradually; the plains become hilly, and the slopes become steeper. Where, and on what basis, do you draw the regional boundary?

To identify and delimit regions, we must establish criteria for them. Imagine that, as an exercise in physical geography, you were asked to delimit the Amazon River...
Basin as a geographic region. There would be various ways to do this: you might use vegetation distribution, soil properties, slope angles, or drainage patterns. When you presented your results, you would first state the basis on which you had mapped the region and then produce the resulting map. On a small scale, the map might resemble Figure 1-7, which uses drainage lines to define the Amazon Basin on the basis of the rivers and tributaries that ultimately drain into this great South American river.

Thus we know that all regions have certain characteristics. These include **area**—that is, they all have some defined spatial extent, location, in that all regions lie somewhere on the Earth’s surface; and limits or **boundaries**, which are sometimes evident on the ground and sometimes not, and are often based on specifically chosen criteria. Regions are not all of the same type. Some are marked by visible uniformity, for example, a desert basin marked by severe aridity, sandy surface, and steep surrounding mountain slopes. Geographers refer to such a homogeneous region as a **formal region**. Formal regions can also be defined by cultural (as opposed to physical) criteria. A region within which French is spoken by, say, 90 percent or more of the population, is also

**Figure 1-6** Railroad Freight in the U.S. Continental Core Region. The comparative amount of freight carried on major North American railroads can be quickly assessed from this map.

- **Figure 1-7** Amazon Basin. The Amazon Basin as a region defined by the main tributaries and topography.
a formal region. A functional region, on the other hand, is the product of interactions, of movement of various kinds. A city, for example, has a surrounding region within which workers commute, either to the downtown area or to subsidiary centers such as office parks and shopping malls (Fig. 1-8). That entire urban area, defined by people moving toward and within it, is a functional region. Thus a functional region is a spatial system, its boundaries are defined by the limits of that system. Finally, regions may be primarily in the minds of people. These perceptual regions are not just curiosities. How people think about regions has influenced everything from daily activity patterns to large-scale international conflict. Regions can be seen in a vertical order or hierarchy. The French-speaking region to which we referred earlier can be thought of as a region within a larger region, namely, Western Europe. Western Europe, in turn, is a region of the European geographic realm. Regions often form a hierarchy based on size and importance.

Regions, therefore, are ways of organizing humans geographically. They are a form of spatial classification, a means of handling large amounts of information so that it makes sense. Thus the regional concept is an indispensable aid in our journey through human geography.

Maps in the Mind

Whether we like it or not, we see and study things from a particular viewpoint, which is shaped by our cultural environment. No matter how hard we try to be objective, a view of the world and its problems (geographic and otherwise) from the United States is not the same as the view from Tanzania or China. Certainly, a map of mountain ranges or known oil reserves might look the same whether it was drawn in China or America, but when we study more subjective things—culture and tradition, politics, or economic development—we may have quite a different outlook. Take, for example, a standard picture of a major city in another country, such as Mexico City, Mexico, or Nairobi, Kenya. Such a picture is likely to show the modern, high-rise buildings of the downtown area, the heart of the city. However, the fact is that the great majority of the people of Mexico City and Nairobi (and dozens of other large cities) live in modest, often inadequate dwellings in vast, sprawling housing tracts that surround the urban core. For many of these people, the skyscrapers of the central city are irrelevant, and city life is a battle for survival in quite a different environment. Shouldn’t a “typical” picture of Mexico City or Nairobi show that image rather than the downtown area?

It is important to realize that our study of the human world contains some cultural bias, no matter how hard we try to see alternative viewpoints. As you get to know geographers, you will find that they tend to be drawn to the field partly because of their interest in, and respect for, other societies and cultures. That, however, does not make us immune to bias or insensitivity. After all, human geography deals with population growth and control, race and religion, economic development, and political institutions, all of which can be touchy subjects.

Mental Maps

Imagine that you are attending a seminar discussion on the political geography of Southern Africa, but there is no wall map to which you can refer. What is your frame of reference? Obviously, it is the countries of the region: South Africa, Namibia, Swaziland, Lesotho, Botswana, Zimbabwe, and their neighbors. As you speak, you will use the map that is in your mind, your mental map of that part of the world. That mental map has developed over years of looking at wall maps, atlas maps, maps in books, magazines, and newspapers.

Mental maps are a fundamental part of our general knowledge; we use them constantly. If someone were to call you to suggest that you go to the theater, a mental map would come to mind: the hallway, the front door, the walk to your car, the lane to choose in order to be prepared for the left turn you must make, where you would prefer to park, and so forth. If your mental map is vague, you will need a city map to find your way. However, if the issue is more serious than a trip to the theater, and a large number of people are poorly informed, vague mental maps can lead to major policy mistakes.

Environmental Perception

Mental maps (also called cognitive maps) are derived from visual observation of the real world (your city or town, college campus, shopping center) and from the scrutiny and study of printed
Figure 1-9 Different Living Preferences. Where Californians and Pennsylvanians would prefer to live based on questionnaires completed by college students. Source: P. R. Gould and R. White, Mental Maps. Harmondsworth: Penguin Books, 1986, pp. 55 and 58. Redrawn by permission of the publisher.
maps. Sights are supplemented by sounds and smells, and the total impression is **environmental perception**. This is the impression that generates our mental map. Since geographers are interested in both the physical world and the human organization of it, environmental perception is a popular geographic topic. We have perceptions of places we know by personal experience, but we also carry images of places we have never visited. What shapes these perceptions? To what extent are they accurate or distorted? In a fascinating book titled *Mental Maps* (1982), geographers Peter Gould and Rodney White begin by asking the following question: If you could move to any place of your choice, without any of the usual financial and other obstacles, where would you like to live? (For their respondents’ answers, see Fig. 1-9.) Perhaps you would select a location that you perceive as attractive but have never personally experienced. However, the actual environment may turn out to be quite different from your perception of it. A crucial part of our perception of a place lies in its layout, that is, its spatial arrangement and organization. To know the location of a country (whether it is Laos or Afghanistan or Bolivia) is only a beginning. From maps we can gain impressions of topography and relief, climate and weather, the quality of roads, the layout of villages and towns, and countless other conditions—without ever having been there. The map is thus our window on the world. See Resource A, Maps, at the end of the book for guidelines on how to read and use maps.

### CHAPTER 1 Geography and Human Geography

#### KEY TERMS

- absolute location
- area
- boundary
- diffusion
- distribution
- environmental geography
- environmental perception
- formal region
- functional region
- geographic information systems
- hierarchy
- human-environment interactions
- human geography
- landscape
- location (absolute, relative)
- location theory
- map
- mental map
- movement
- pattern
- perceptual region
- physical (natural) geography
- place
- regional science
- regions (formal, functional)
- relative location
- remote sensing
- spatial perspective

#### APPLYING GEOGRAPHIC KNOWLEDGE

1. Imagine yourself living and working in a small town in a rural area of the Midwest. Your family owns and operates a small department store located at the busiest intersection in town, where the through road crosses the main shopping street. Now the State Highway Department is building a four-lane highway that will bypass your town about six miles away. How will this change your store’s relative location? How will it affect your market? What might you and other shop owners do to counter the impact of the new highway?

2. The editor of a city newspaper has appointed you to her staff, and your first job as a geographer is to draw a map of the region within which the paper sells, that is, its market. Describe how you will go about this, what will be the criteria on which this functional region is based? When you have finished your map, the region turns out to be quite asymmetrical; the paper sells as far as 100 miles north of the city but only 60 miles to the south. What might explain this variable “reach” of the newspaper?