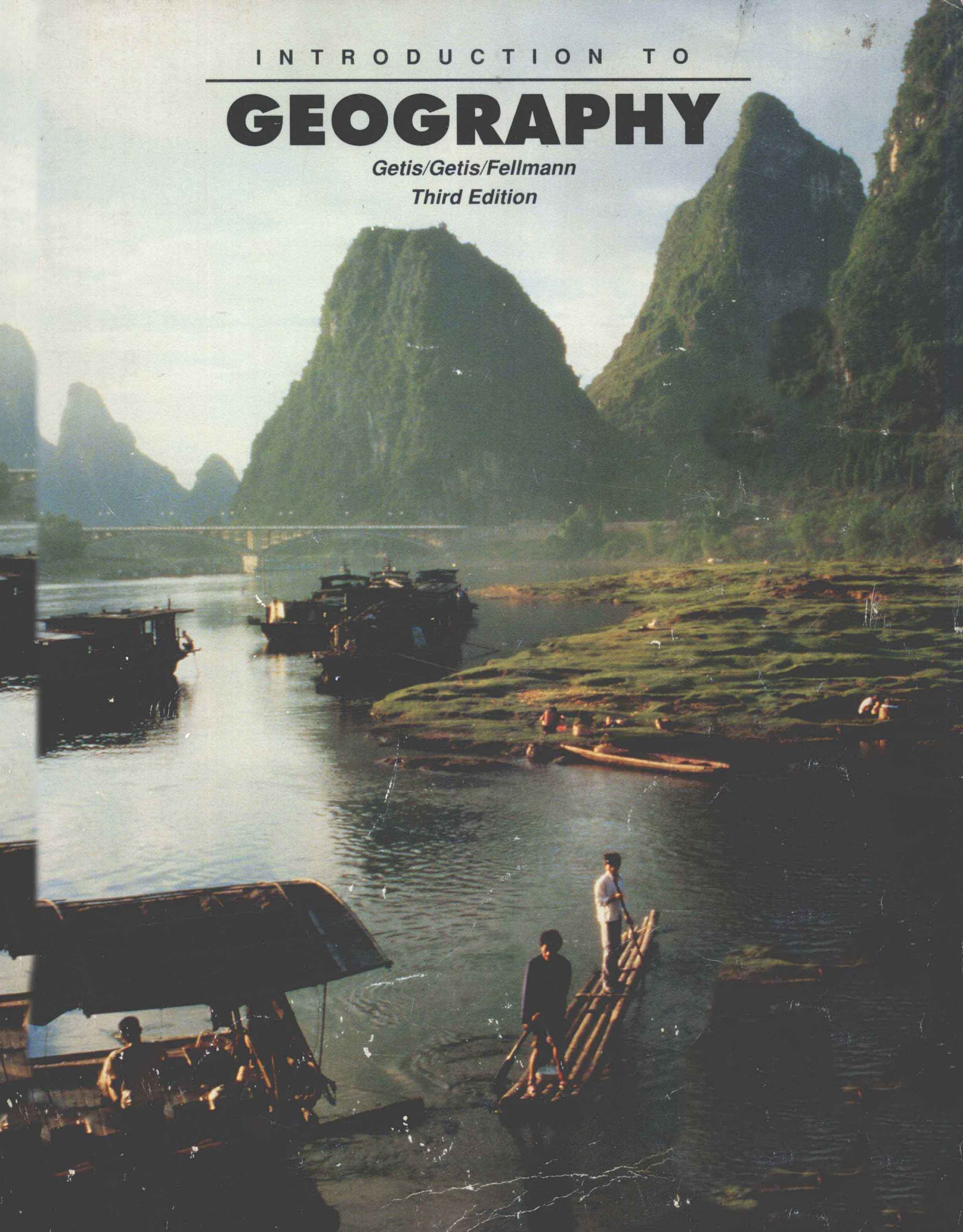


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GEOGRAPHY

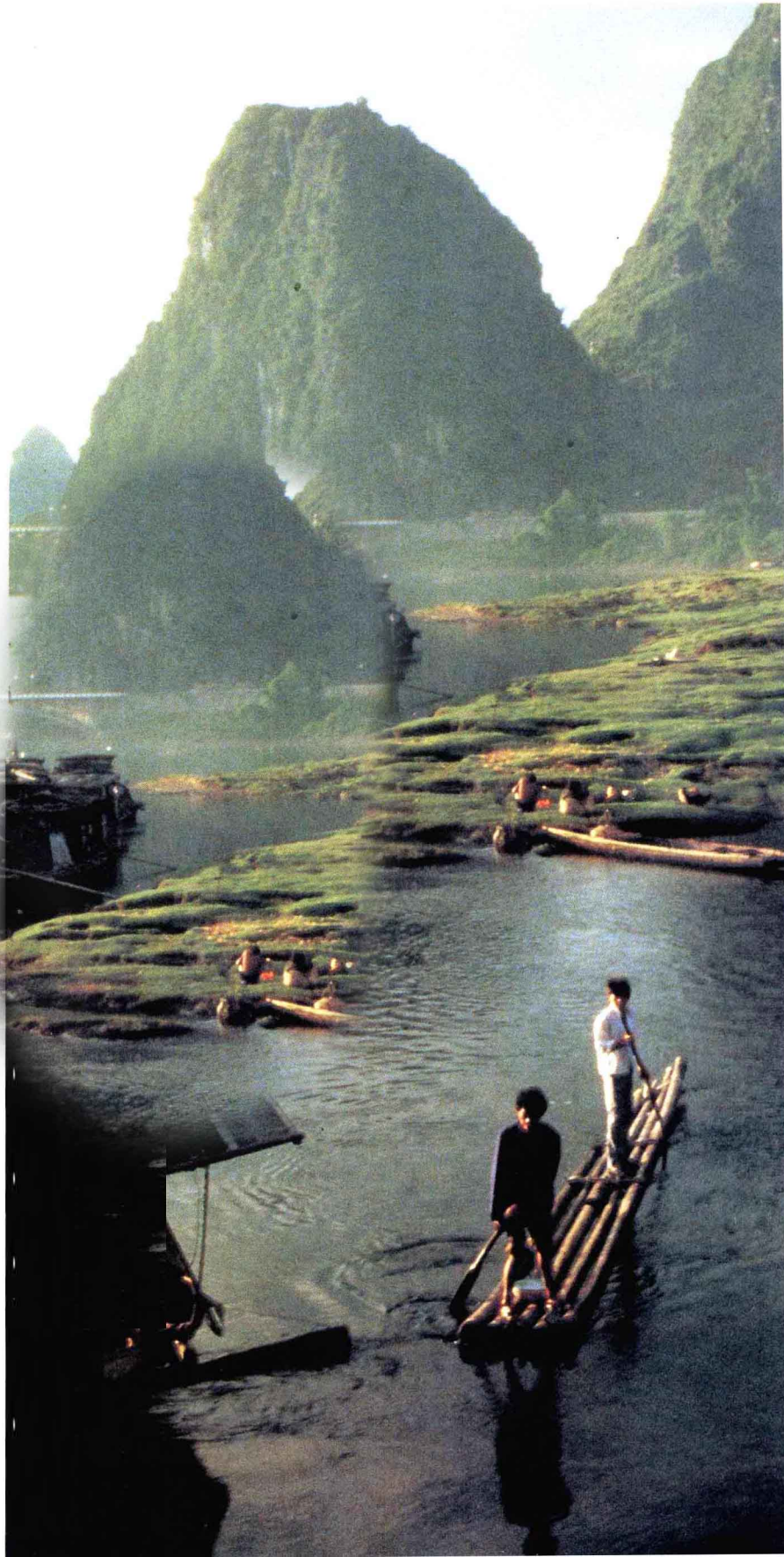
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I N T R O D U C T I O N T O

GEOGRAPHY

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Third Edition



Wm. C. Brown Publishers

This third edition of *Introduction to Geography* retains the purpose of its predecessors: to introduce college students to the breadth and excitement of the field of geography. Like previous editions, its content is organized around the major research traditions of the discipline, a structure that adopters of earlier editions have found to be attractive to students and convenient and flexible for instructors.

Although the framework of presentation has been retained in this current edition, we have added and deleted materials to reflect current advances in the several topical areas considered, updated facts, and made every effort to profit by suggestions offered by users and colleagues to improve content. Among these suggestions were helpful ideas for substantial restructuring of the chapters on cultural, behavioral, and economic geography and for recasting the content of the political and urban geography discussions. We are grateful for those suggestions.

We recognize that many students will have only a single college course and textbook in geography. Our purpose for those students is to convey concisely but clearly the nature of the field, its intellectual challenges, and the logical interconnections of its parts. Even if they take no further work in geography, we are satisfied that they will have come into contact with the richness and breadth of our discipline and have at their command new insights and understandings for their present and future role as informed adults. Other students may have the opportunity and interest to pursue further work in geography. For them, we believe, this text will make apparent the content and scope of the subfields of geography, emphasize its unifying themes, and provide the foundation for further work in their areas of interest.

The approach we take is to let the major research traditions of geography dictate the principal themes we explore. As Chapter 1 makes clear to students, the organizing traditions that have emerged through the long history of geographical thought and writing are those of

earth-science, culture–environment, location, and area analysis. Each of the four parts of this book centers on one of these geographic perspectives. Within each part, except that on area analysis, are chapters devoted to the subfields of geography, each placed with the tradition to which we think it belongs. Thus, the study of weather and climate is part of the earth-science tradition; population geography is considered under the culture–environment tradition; and urban geography is included with the locational perspective.

Of course, our assignment of a topic may not seem appropriate to all users since each tradition contains many emphases and themes. Some subfields could logically be attached to more than one of the recognized traditions. The rationale for our clustering of chapters is given in the brief introductions to each part of the text. The tradition of area analysis—of regional geography—is presented in a single final chapter that draws upon the preceding traditions and themes and is integrated with them by cross-references.

In this revision we have made every effort to incorporate the most current viewpoints and approaches and to include the data on which they are based. Many of the diagrams, maps, and photographs are new to this edition. Their frequently extensive accompanying captions convey additional information and explanation—that is, are part of the text—not just identification or documentation of the illustration. Chapter introductions are designed to capture students' attention, arousing their interest in the vignette itself and, therefore, in the subject matter that follows. In addition, each chapter contains boxed inserts that further embellish points or ideas included in the text proper. In short, every effort has been made to gain and retain student attention—the essential first step in the learning process.

Chapter 1 prepares the student for the later substantive chapters. It introduces the field of geography as a whole, noting breadth of interests, and the unifying

questions, themes, and concepts that structure all geographic inquiry whatever the specialized subfield of interest. It also outlines for the student the organization of the book and explains the several “traditions” forming its framework.

Important to that framework is the terminal single chapter treatment of the area analysis tradition. The case studies and examples that Chapter 13, “The Regional Concept,” contains illustrate the regional geographic application of the systematic themes developed by the earlier chapters. Regional understanding has always been an important motivation and justification of geography as a discipline; Chapter 13 is designed to introduce students to the diversity of regional geographic exposition. It may be read either as a separate chapter or in conjunction with the earlier material. That is, each systematic chapter contains a reference to the portion of Chapter 13 where a relevant regional geographic example is to be found. That referenced case study, of course, can be incorporated to demonstrate the relationships of regional and systematic geography, to show the “real world” application of geographic understandings, and to provide a springboard for further case studies as class or instructor interest may dictate. The included regional studies may also serve as models for independent student reports by applying to specific cases the insights and techniques of analysis developed in the separate substantive chapters.

Learning aids at the conclusion of each chapter include a Summary, a list of Key Words together with a page reference to the location where each term is defined and discussed, For Review questions designed to help students check on their understanding of the chapter material, and a Selected References listing of important recent or classic considerations of the subject matter of the chapter. We have tried to include not only relatively widely available recent textbook and other titles, many containing additional extensive bibliographies, but also more specialized articles and monographs useful to students who are motivated to delve more deeply into particular subfields of geography.

At the end of the book we have placed a comprehensive Glossary of terms and, as a special Appendix, a modified version of the *1990 World Population Data Sheet* of the Population Reference Bureau. In addition to basic demographic data and projections for countries, regions, and continents, the *Data Sheet* includes statistics on gross national product, energy consumption, and access to safe

water supply. Although inevitably dated and subject to change, the appendix data nonetheless will provide for some years a wealth of useful comparative information for student projects, regional and topical analyses, and study of world patterns.

A useful textbook must be flexible enough in its organization to permit an instructor to adapt it to the time and subject-matter constraints of a particular course. Although designed with a one-quarter or one-semester course in mind, this text may be used in a full-year introduction to geography when employed as a point of departure for special topics and amplifications introduced by the instructor or when supplemented by additional readings or class projects. Moreover, the chapters are reasonably self-contained and need not be assigned in the sequence here presented. The “traditions” structure may be dropped and the chapters rearranged to suit the emphases and sequences preferred by the instructor or found to be of greatest interest to the students. The format of the course should properly reflect the joint contribution of instructor and book rather than be dictated by the book alone.

A number of reviewers, anonymous at the time, greatly improved the content of this book by their critical comments and suggestions. With pleasure we acknowledge the thoughtful assistance rendered by James C. Hughes, Slippery Rock University; Paul Butt, University of Central Arkansas; Edward Babin, University of South Carolina–Spartanburg; and Kavita Pandit, University of Georgia. We are also indebted to W. D. Brooks and C. E. Roberts, Jr., of Indiana State University for the projection used for many of the maps in this book: a modified van der Grinten. We gratefully thank these and unnamed others for their help and contributions and specifically absolve them of responsibility for decisions on content and for any errors of fact or interpretation that users may detect.

Finally, we note with deep appreciation and admiration the efforts of the publisher’s “book team” separately named on the reverse of the title page. In particular, we acknowledge the supportive interest of our editor, Jeffrey L. Hahn; the careful and superbly professional guidance of Senior Developmental Editor Lynne M. Meyers; the helpful and dedicated efforts of Senior Production Editor Ann Fuerste; and the design skills of Mark E. Christianson.

Arthur Getis
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1

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Vacationers along the Costa Blanca in Spain.

GOVERNMENT inspectors had issued the first of two warnings about the dam nearly a year before, but no repairs had been made. Fortunately, workers spotted the cracks early, and when the dam broke, letting loose a 20-foot (6-m) wave, the villages had been cleared and all train and highway traffic stopped. What poured through the breach was not just water, but a thick deadly brine, the impounded discharge of a major fertilizer plant. On its rush to the river, the brine swept away railroad track, ripped up roads, smashed through a village, inundated 500 acres (200 hectares) of the nation's richest farmland, and spilled into the purest river left in the western part of the country. Worse than the immediate physical destruction were the aftereffects. Two thousand tons of fish were destroyed along with all of the vegetation that could support their replacement. Water supplies to two major and many minor cities were cut off as the formerly pure river became "brinier than the saltiest seawater," and a million tons of salt were deposited in a layer 35 feet (10.5 m) thick at the bottom of a major reservoir 300 miles (480 km) downstream.

The accident happened in 1983 in the western part of the Soviet Union and affected the Dniester River from near the Polish border all the way to the Black Sea. The details of its location are less important than the lessons contained in the event. The wall of brine, the destruction of farmland and fish, the salt layer at the lake bottom, and the scramble for alternate water supplies are dramatic evidence of the pressures humans place upon the environment of which they are a part. Radioactive waste materials and atmospheric discharges through nuclear plant accidents, deadly manufactured chemicals, accelerated erosion through unwise forestry and farming practices, the creation of deserts through overgrazing, the poisoning of soils by salts from faulty irrigation and of groundwater through deep-well injection of the liquid garbage of modern industry—all are evidences of the adverse consequences of human pressures upon natural systems. The social and economic actions of humans occur within the context of the environment and have environmental consequences too dangerous to ignore.

The interaction of human and environmental systems works both ways. People can inflict irreparable damage upon the environment and the environment can exact a frightening toll from the societies that inappropriately exploit it.

November is the cyclone season in the Bay of Bengal. At the northern end of the bay lie the islands and the lowlands of the Ganges Delta, a vast fertile land, mostly below 30 feet (9 m) in elevation, made up of old mud, new mud, and

marsh. Densely settled by desperately land-needy people, this delta area is home to the majority of the population of Bangladesh. Early in November of 1970 a low-pressure weather system moved across the Malay Peninsula of Southeast Asia and gained strength in the Bay of Bengal, generating winds of nearly 150 miles (240 km) per hour. As it moved northward, the storm sucked up and drew along with it a high wall of water. On the night of November 12, with a full moon and highest tides, the cyclone and its battering ram of water slammed into the islands and the deltaic mainland. When it had passed, some of the richest rice fields in Asia were gray with the salt that ruined them, islands totally covered with paddies were left as giant sand dunes, and an estimated 500,000 people had perished.

Should the tragedy be called the result of the blind forces of nature, or should it be seen as the logical outcome of a state of overpopulation that forced human encroachment upon lands more wisely left as the realm of river and sea (Figure 1.1)?

As a discipline, geography does not attempt to make value judgments about such questions. **Geography does claim, however, to be a valid and revealing approach to contemporary questions of political, economic, social, and ecological concern. Humans and environment in interaction; the patterns of distribution of natural phenomena affecting human use of the earth; the cultural patterns of occupation and exploitation of the physical world—these are the themes of that encompassing discipline called geography.**

Geographic knowledge is vital to an understanding of the important national and international problems that dominate daily news reports. Acid rain and the greenhouse effect, the decline of manufacturing in the "Rust Belt" and migration to the "Sunbelt," the deterioration of urban areas and the rise of crime associated with the use of illicit drugs, international trade deficits, problems of food supply and population growth in developing countries, turmoil in Central America and the Middle East—all these occur in a geographic context, and geography helps to explain them. To be geographically illiterate is to deny oneself not only the ability to comprehend world problems but also the opportunity to contribute meaningfully to the development of policies to deal with them.

Roots of the Discipline

Geography literally means "description of the earth." It is a description in which people and their activities assume a central position. As a way of thinking about and analyzing the earth's surface, its physical patterns, and human occupation, geography has ancient roots. **It grew out of early Greek philosophical concern with "first beginnings"**

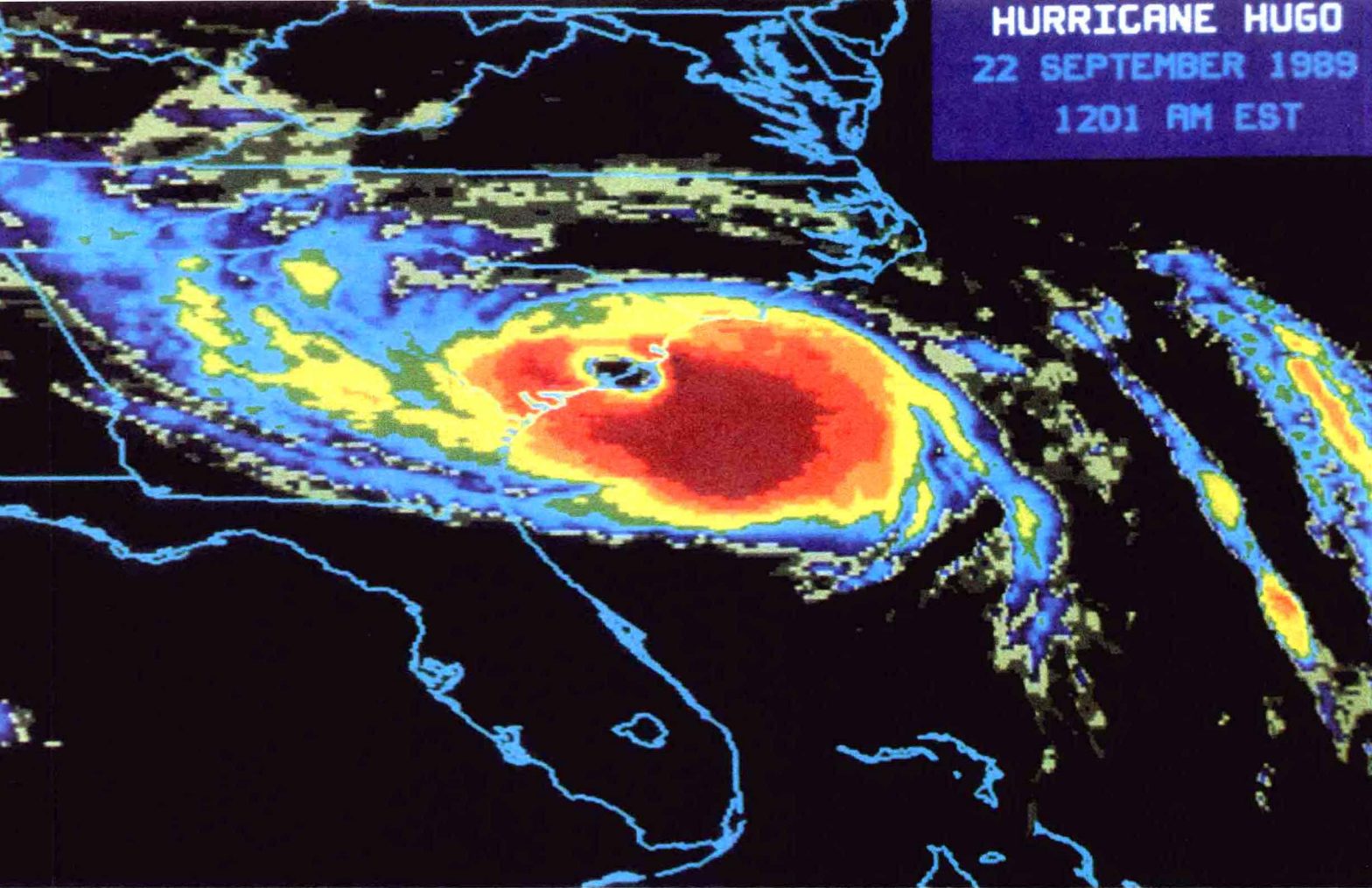


Figure 1.1

Hurricane Hugo, one of the most devastating storms ever to hit the Caribbean Islands and U.S. mainland, is shown here approaching the South Carolina coast in September 1989. Winds of 135 miles per hour (216 km per hour) and a storm surge of water 20 feet (6 m) high ravaged the islands offshore and did

more than \$4 billion damage to mainland Charleston and nearby cities and towns. Much of the damage occurred on barrier beaches and along ocean shore resorts that had been heavily developed and built up despite recurring warnings by environmentalists that such a disaster might take place. (See also Figure 9.6.)

and with the nature of the universe. From that broader inquiry, it was refined into a specialized investigation of the physical structure of the earth, including its terrain and its climates, and the nature and character of its contrasting inhabited portions.

To Strabo (c. 64 B.C.–A.D. 20), one of the greatest of Greek geographers, the task of the discipline was to “describe the known parts of the inhabited world . . . to write the assessment of the countries of the world [and] to treat the differences between countries.” Even earlier, Herodotus (c. 484–425 B.C.) had found it necessary to devote much of his book to the lands, peoples, economies, and customs of the various parts of the Persian Empire as necessary background to audience understanding of the causes and course of the Persian wars.

Geographers measured the earth, devised the global grid of latitudes and longitudes, and drew upon this grid surprisingly sophisticated maps of their known world

(Figure 1.2). They explored the apparent latitudinal variations in climate and described in numerous works the familiar Mediterranean basin and the more remote, partly rumored lands of northern Europe, Asia, and equatorial Africa. Employing nearly modern concepts, they described river systems, explored cycles of erosion and patterns of deposition, cited the dangers of deforestation, and noted the consequences of environmental abuse. Strabo cautioned against the assumption that the nature and actions of humans were determined by the physical environment they inhabited. He observed that humans were the active elements in a cultural–physical partnership.

So broad and integrated are the concerns of geography and so great the variety of facts, observations, and distributions that guide its analyses, that it has been called the mother of sciences. From its earlier concerns have sprung such specialized, independent disciplines as meteorology, climatology, cultural anthropology, geology, and

a host of other fields of inquiry. From such areas of study, geographers draw the background data that contribute to their own broader investigation of human–environment systems and spatial relationships.

Basic Geographic Concepts

Although such investigations may serve broadly to define the field of geography, its nature is best understood through the questions geographers ask and the approaches they employ to answer those questions. Of a physical or cultural phenomenon, they will inquire: What is it? Where is it? How did it come to be what and where it is? Where is it in relation to other physical or cultural realities that affect it or are affected by it? How is it part of a functioning whole? How does its location affect people's lives?

These and similar questions derive from central themes in geography. In answering them, geographers respond by using certain fundamental concepts and terms. Together, the themes, concepts, and terms form the basic structure and vocabulary of geography. They recognize the fundamental truths addressed by geography: that things are rationally organized on the earth's surface and that understanding spatial patterns is an essential starting point for understanding how humans live on the earth.

Geography is about earth places and spaces. The questions that geographers ask originate in basic observations about the nature of places and how places are similar to or different from one another. Those observations, though simply stated, are profoundly important to our comprehension of the world we occupy. They are:

A place may be large or small.

A place has location.

A place has both physical and cultural characteristics.

The characteristics of places develop and change over time.

Places interact with other places.

Places may be generalized into regions of similarities and differences.

Size and Scale

When we say that a place may be large or small, we speak both of the nature of the place itself and of the generalizations that can be made about it. In either instance, geographers are concerned with **scale**, though we may use that term in different ways. We can, for example, study a problem—population, say, or landforms—at the local scale or on a global scale. Here, the reference is purely to the

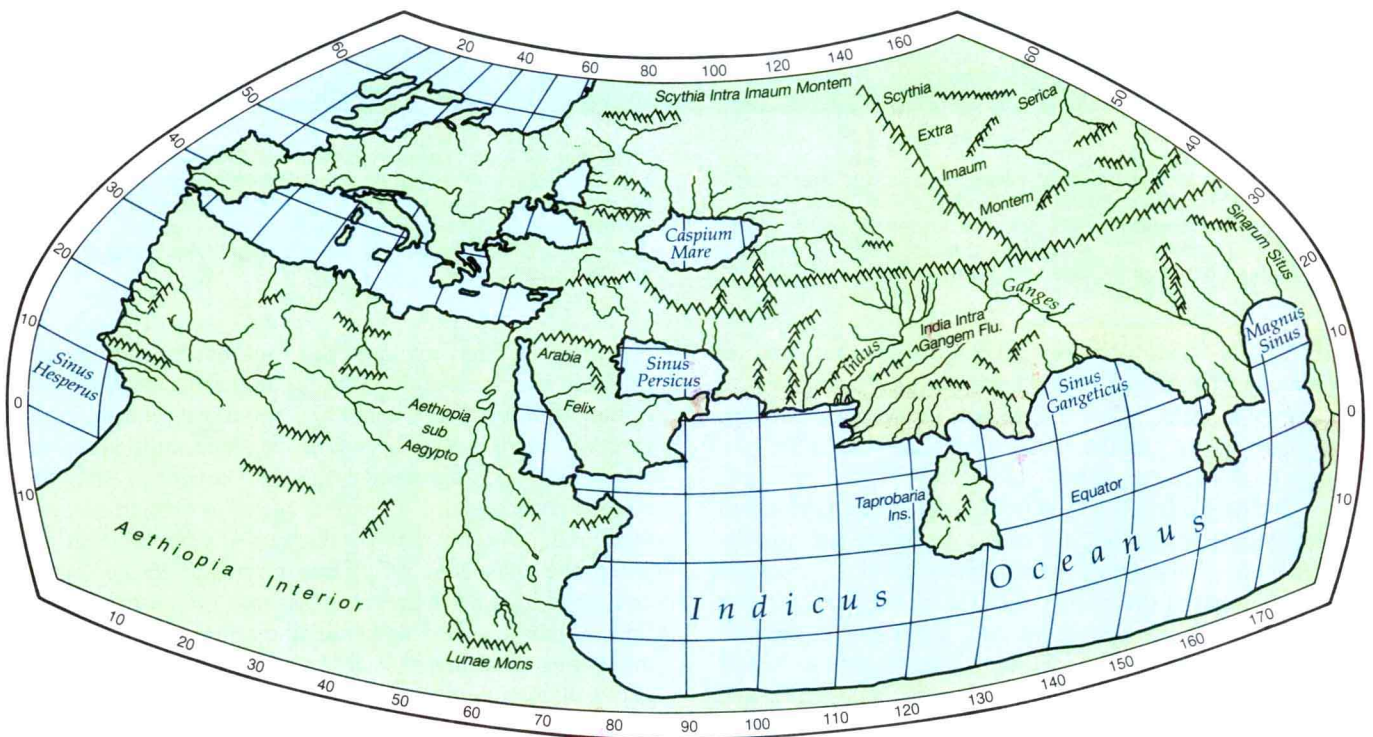


Figure 1.2

Ptolemy's world outline from the Rome edition of 1490. The 2d-century A.D. Roman geographer-astronomer Ptolemy (Claudius Ptolemaeus) adopted an already developed map grid of latitude and longitude lines based on the division of the circle into 360°. The grid permitted a precise mathematical location for every

recorded place. Unfortunately, errors of assumption and estimation rendered both Ptolemy's map and its accompanying six-volume gazetteer inaccurate. Many variants of Ptolemy's map were published in the 15th and 16th centuries. The version shown here summarizes the extent and content of the original.

size of unit studied. More technically, **scale tells us the relationship between the size of an area on a map and the actual size of the mapped area on the surface of the earth.** In this sense, as Chapter 2 makes clear, scale is a feature of every map and essential to recognizing what is shown on that map.

In both senses of the word, **scale implies the degree of generalization represented** (Figure 1.3). Geographic inquiry may be broad or narrow; it occurs at many different size-scales. Climate may be an object of study, but research and generalization focused on climates of the world will differ in degree and kind from study of the microclimates of a city. Awareness of scale is very important. In geographic work, concepts, relationships, and understandings that have meaning at one scale may not be applicable at another scale.

Location

The location of a place may be described in both absolute and relative terms. **Absolute location** records a precise position on the surface of the globe, usually in terms of a mathematically based reference system. The global grid of latitude and longitude is commonly employed for absolute location. In United States property description, a reference to township, section, and range is customary in

those parts of the country where that survey system exists. Absolute location is unique to each described place, is independent of any other characteristic or observation about that place, and has obvious usefulness in legal description of places, in measuring the distance separating places, or in finding directions between places on the earth's surface.

When geographers remark that "location matters," however, their reference is usually not to absolute but to **relative location—the location of a place or thing in relation to that of other places or things.** Relative location expresses spatial interconnection and interdependence. It tells us that people, things, and places exist in a world of physical and cultural characteristics that differ from place to place. The attributes and potentialities of a particular locale are understandable only as that locale is seen in its spatial relationship to other places with their own attributes (Figures 1.4 and 12.9). Again, the idea of scale comes into play. Depending upon the place and characteristic studied, spatial relationships may be traced at the local, regional, national, or global scales, with each scale reference to relative location adding to our understanding of place.

New York City, for example, may in absolute terms be described as located at (approximately) latitude 40°43' N (read as 40 degrees, 43 minutes north) and longitude

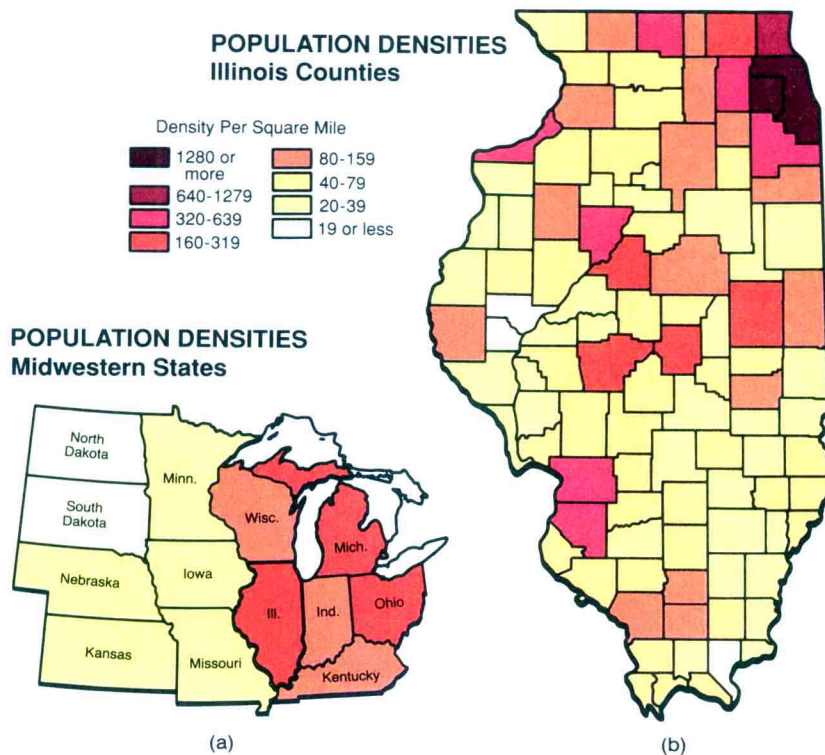


Figure 1.3

"Truth" depends on one's scale of inquiry. Map (a) reveals that the maximum population density of Midwestern states is no more than 319 per square mile (122 per km²). From map (b), however, we see that population densities in two Illinois counties

exceed 1280 people per square mile (494 per km²). Were we to reduce our scale of inquiry even further, examining individual city blocks in Chicago, we would find densities as high as 5000 people per square mile (1930 per km²). Scale matters!

73° 58' W. We have a better understanding of the *meaning* of its location, however, when reference is made to its spatial relationships: to the continental interior through the Hudson-Mohawk lowland corridor; to its position on the eastern seaboard of the United States; to its role as a transportation node and multifunctional economic and administrative center of a major industrial country of the Northern Hemisphere; and to its interconnections, through trade routes, financial ties, and the United Nations, to the international community. Within the city, we gain understanding of the locational significance of, for example, Central Park or the Lower East Side not by reference solely to the street addresses or city blocks they occupy but by their spatial and functional relationships to the total land use, activity, and population patterns of New York City.

Physical and Cultural Attributes

All places have individual physical and cultural attributes distinguishing them from other places and giving them character, potential, and meaning. Geographers are concerned with identifying and analyzing the details of those attributes and, particularly, with recognizing the interrelationship between the physical and cultural components of area: the human-environmental interface.

The physical characteristics of a place refer to such natural aspects of a locale as its climate and soil, the presence or absence of water supplies and mineral resources, its terrain features, and the like. These attributes provide the setting within which human action occurs. They help shape—but do not dictate—how people live. The resource base, for example, is physically determined, though how resources are perceived and utilized is culturally conditioned.

Environmental circumstances directly affect agricultural potential and reliability; indirectly, they may affect such matters as employment patterns, trade flows, population distributions, national diets, and so on. The physical environment simultaneously presents advantages and disadvantages with which humans must deal. Thus, the danger of cyclones in the Bay of Bengal must be balanced against the agricultural bounty derived from the region's favorable terrain, soil, temperature, and moisture conditions. Physical environmental patterns and processes are explored in Chapters 3 and 4 of this book.

At the same time, by occupying a given place, people modify its environmental conditions. The existence of the American Environmental Protection Agency (and its counterparts elsewhere) is reminder that humans are the active and frequently harmful agents in the continuing spatial interplay between the cultural and physical worlds (Figure 1.5). Virtually every human activity leaves its imprint on the earth's soil, water, vegetation, animal life, and other resources, and on the atmosphere common to all earth space, as Chapter 5 makes clear.

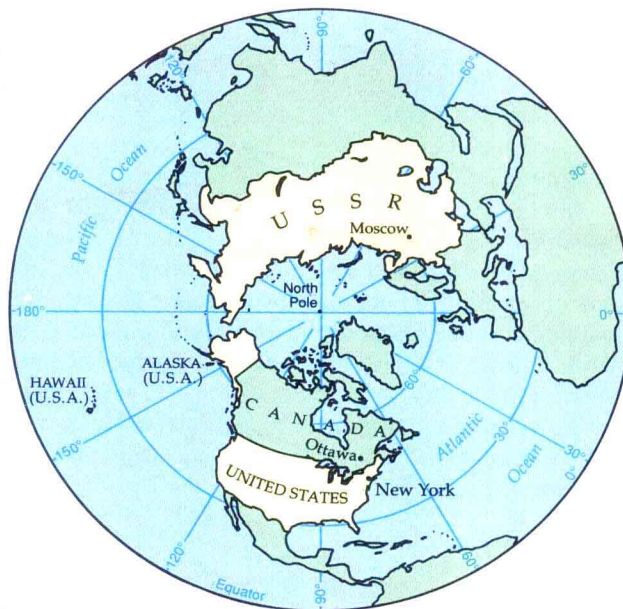


Figure 1.4

The reality of *relative location* on the globe may be strikingly different from the impressions we form from flat maps. The position of the USSR with respect to North America when viewed from a polar perspective emphasizes that relative location properly viewed is important to our understanding of spatial relationships and interactions between the two world areas.



Figure 1.5

Sites (and sights) such as this devastation of ruptured barrels and petrochemical contamination near Texas City, Texas, are all-too-frequent reminders of the adverse environmental impacts of humans and their waste products. Many of those impacts are more hidden in the form of soil erosion, water pollution, increased stream sedimentation, plant and animal extinction, deforestation, and the like.

The visible imprint of that human activity is called the **cultural landscape**. It, too, exists at different scales and at different levels of visibility. Differences in agricultural practices and land use between Mexico and southern California are evident in Figure 1.6, while the signs, structures, and people of Los Angeles' Chinatown leave a smaller, more confined imprint within the larger cultural landscape of the metropolitan area itself.

The physical and human characteristics of places are the keys to understanding both the simple and the complex interactions and interconnections between people and the environments they occupy and modify. Those interconnections and modifications are not static or permanent, but are subject to continual change.

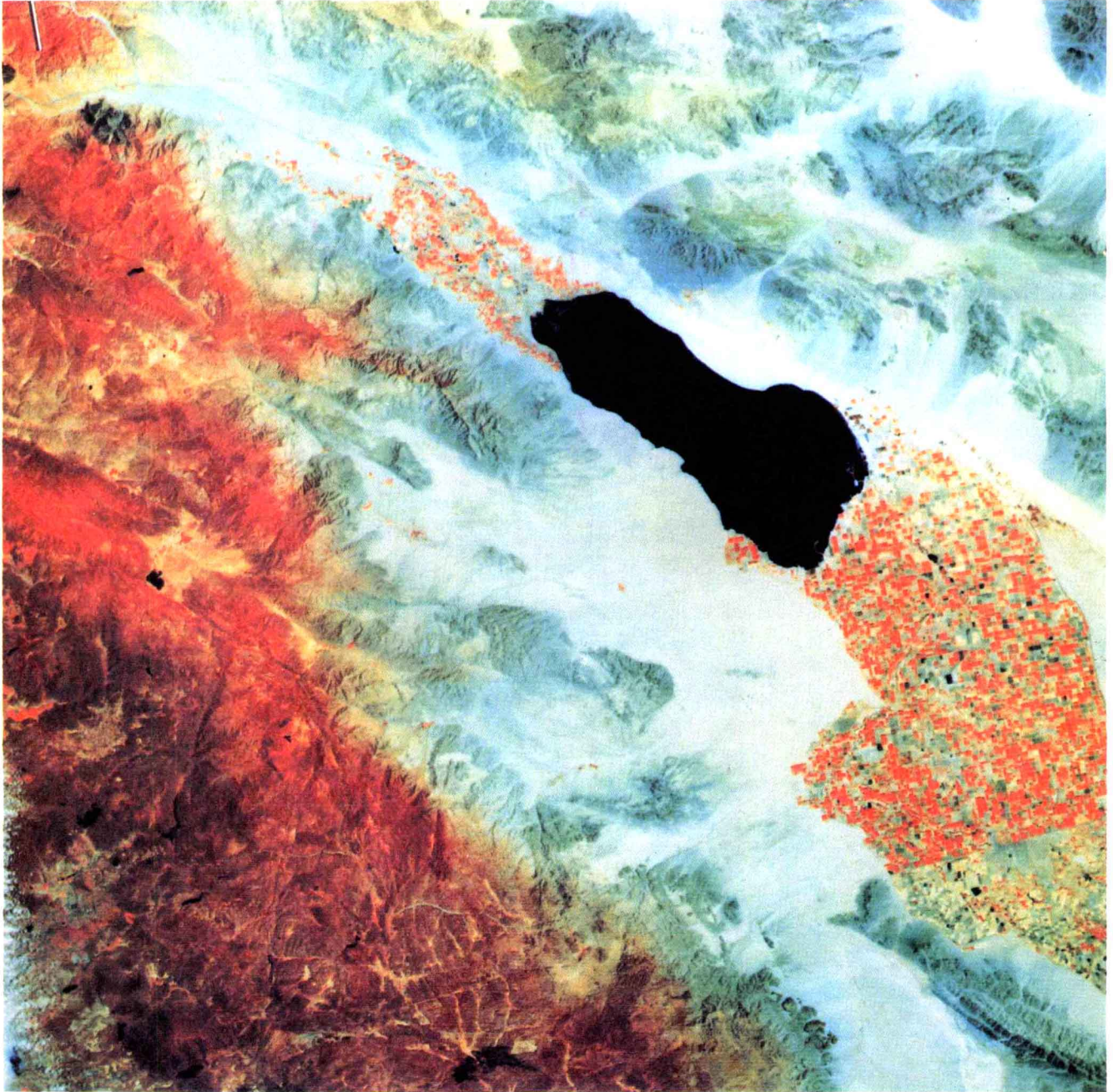


Figure 1.6

This Landsat image reveals different land use patterns in California and Mexico. Slowly move your eyes from the Salton Sea (the dark patch near the center of the image) to the agricultural land extending to the southeast and to the edge of the picture. Notice how the regularity of the fields and the bright

colors (representing growing vegetation) give way to a marked break, where irregularly shaped fields and less prosperous agriculture are evident. North of the break is the Imperial Valley of California; south of the border is Mexico.