

# ELEMENTS OF GEOGRAPHY

## Physical and Cultural

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## PREFACE

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The second edition of this book, like the first, is designed to supply textual material covering the elements of geography in a form particularly suited to classroom discussion in beginning courses in college geography. The special merit of the treatment of the subject employed in this text is believed to lie in the choice of the material that has been included in it, in the structure of its organization, and in the manner of its presentation.

The selection of material for inclusion has been made with a single objective: to describe and depict the major elements of geography and to enable the student to acquire a background for interpreting the significance of their areal association. The material included is confined to the development of what may be considered a check list of the elements of natural earth and the elements of material culture. In this an attempt has been made to lay a solid foundation for studies in cultural geography by description and analysis of the habitat potentialities of the natural features of the earth and its conspicuous forms of human culture. The material is presented in a manner that the authors believe furnishes a basis not only for understanding on the part of the student but also for a full and rich classroom discussion of the subjects included.

The structure of the book's organization is considered by the authors an essential part of the presentation. It includes (a) two opening chapters which provide a degree of orientation in the field of geography, together with certain basic facts and geographical tools, and (b) two principal parts. The latter treat, respectively, of (i) the elements of natural earth and (ii) the elements of material culture.

Part I of the book receives the most extended treatment, and it has been divided into five sections of several chapters each. This

organization has the merit of enabling the student to distinguish clearly between the *elements* of weather and climate and the *types* of climate into which they are combined, and of distinguishing earth *processes* from the classes of earth *features* produced by them. The emphasis has been placed deliberately upon the nature or form of the elements of geography and upon their world distribution rather than upon the processes of their origin. Not that the rational interpretation of features through the manner of their origin is neglected. It is employed constantly, but in part the discussion of process is segregated, and always it is made secondary in importance to the essential physical characteristics of the features produced. In this respect the treatment of landforms, for example, is to be distinguished sharply from that which is customary in physiography or physical geology.

Part II of the book alone deals with the features of material culture essential to geography. Omitting that part, the book functions as a basic text for a course in natural science. Just as Part I is an analytical treatment of natural features, so Part II is a similar, but briefer, analysis of the *types of features* resulting from human beings occupying regions. This manner of treatment of the subject of material culture is new to American textbooks of geography. Part III of the earlier edition, which concerned the associations of physical features characteristic of each of the great geographical realms of the earth, has been omitted as such, but certain of its features have been incorporated with Parts I and II.

The revision of the *Elements of Geography* from its original form has been suggested from three directions; the rapid advancement of knowledge in some of the fields upon which it touches, the practical test of five years of classroom use, and the kindly criticism of professional colleagues. Section *A* of Part I, which treats of the elements of weather and climate, has required the most thorough revision. This has been made necessary by recent and extensive changes in physical climatology, particularly in those aspects of the subject dealing with the nature and behavior of air masses, the types and significance of storms, etc. In the revision of both Sections *A* and *B*, the latter dealing with climatic types and their distribution, every effort has been made to abbreviate and simplify the numerous details in order that the essentials shall be emphasized and that the whole presentation may more readily be grasped by the beginning student.

Sections *C* and *D* of Part I, which deal, respectively, with the origin of landforms and with the characteristics and classification of

landforms themselves, have seemed to require less revision. The changes that were made have, it is believed, resulted in the clarification of obscure points, the avoidance of some controversial matters, and the omission of certain details on which there is recognized difference of scientific opinion beyond the concern of an introductory course. Similar changes have been made in Section *E*, which deals with earth resources, particularly in the chapters which are concerned with the nature and classification of soils and the distribution of the principal soil groups of the world.

Those who are familiar with the structure of the earlier edition of the book will find the most extensive changes of all in Part II, which surveys the cultural elements of geography. As before, this discussion is concerned with the nature and classification of the significant elements of human culture manifest in the geographical scene. However, the treatment of them has been much expanded, their inherent qualities are analyzed, the bases of their classification are indicated, and the significant features of their world patterns are introduced. Many details of cultural form and feature have been added. The purpose of these, however, is not to present a brief human geography of the world but to give added significance to the bases of classification upon which the facts of world geography may be brought into rational order in other courses which may follow this introduction to the field. The present discussion is an attempt at a scheme of analysis and classification of cultural elements comparable with and parallel to that applied to the physical elements in Part I of the book. Admittedly, the development of theory and the body of knowledge adaptable to this procedure are less complete than for the physical elements, which are the special fields of several branches of science. It is not remarkable therefore that Part II of the book is not equal in extent with Part I.

It may be asked why the authors have so restricted their discussion of the cultural elements of geography and why they have not dealt at some length with the social implications of the various elements of physical earth. In some geography books the description of each of the physical features is followed by a summary of the human activities supposedly related to that feature. For example, the study of the physical characteristics of mountains will be supplemented by a description of the activities "dependent on or centered about" mountains. Such a treatment bespeaks a belief that geographical science is primarily concerned with showing how and to what degree physical earth influences human affairs. To such a philosophy of their subject the present authors cannot subscribe.

It may be asked also why the authors have not enlarged upon numerous themes suggested by the discussions of the cultural elements. Why, for example, have they not considered the world patterns of wheat production or forest exploitation or of any other of the many topics which are a part of the body of systematic economic geography? It may only be stated that this was not their objective. Neither was it their purpose to explore the complex of areal associations that comprise the field of regional study in its full geographical sense. Rather, their purpose has been, as was noted above, to show that *the elements of geography, physical and cultural, are capable of analysis and classification* and to show something of the pattern of distribution of each of these elements over the surface of the earth. Only after these functions have been performed does the student begin to distinguish the elements as such and to appreciate the significance of their areal associations. The details of these complex associations, whether treated from the systematic or the regional viewpoint, are, however, left to other authors and other courses of study.

Several grades of distinction in type have been employed in the part, section, chapter, and center headings of the book for the purpose of keeping before the student the nature of the structural outline within which he works. Also, the component *articles* of the chapters have been numbered serially through the book. It is believed that this feature will be of use in encouraging forward and backward reference by the student and in making easy the definition of class assignments by the instructor. It will be noted also that many of the numbered articles are further distinguished by being printed in slightly smaller type and shorter lines. Those articles are selected as having a secondary or elaborative place in the discussion, and they are, by their type and length of line, indicated for omission by students in briefer courses where there is not time to consider all the topics presented in the book.

The authors have striven for readability as well as explicitness in the style of the text. They have undertaken also, sometimes at the expense of brevity, to place special emphasis upon certain phases of the discussion. The interrelated nature of the subjects treated and the structure of the presentation both facilitate emphasis. The same association of facts may be, and often is, approached from two or more directions in as many different connections. This has made emphasis possible by a judicious use of repetition or by restatement to suit the new occasion.

The style of presentation seeks to avoid being merely a compendium of facts. The elements of geography are ordered, and the student is

led to distinguish, by comparison and contrast, similar but not identical elements. Since this text attempts to lay a good foundation for the understanding of the geographical forms, patterns, and associations of world regions, many statements of fact and association concerning the features of specific world regions or localities have been included. To study these statements most effectively the student should make frequent reference to an atlas. Instructors are urged to see to it that students have facilities for that kind of study.

The text illustrations have been drawn or selected with the special purpose of centering attention upon significant features under discussion and of making possible a reduction in the amount of descriptive text. To that end they are placed in as close proximity to the related text as possible, although, in order to save space, some illustrations are made to serve in more than one connection. The plates that accompany the book have been prepared in blank. They are intended for student drawing and coloring as a manual aid to the appreciation of significant facts and associations in the distributions of geographical phenomena. Duplicate sets of these plates may be obtained from the publisher. Relatively few rainfall and temperature data have been presented in graphic form in the text, since it is believed that the student profits much more by the construction of these graphs for himself. A plate containing a number of coordinate paper blocks provides facilities for doing this. In addition to the classified climatic data provided for the several types of climate within the text proper, data for other stations are available in Appendix *A*.

Through teaching experience it has been found that in most introductory courses there is scant time for the development of the subject matter relating to forms of map projection, however much the instructor would like to present it. That has therefore been omitted from the body of the text and transferred to Appendix *B*, where it still is available for reference or for those teachers having time or inclination to use it. The balance of the former Chapter III, dealing with the general features of maps, has been incorporated with Chapter II. Appendix *D* has been added to deal with the American systems of land survey.

Reference lists are appended to those chapters, sections, or parts of the book that treat of distinct fields without conspicuous overlap in source material. These have been revised to include significant publications of recent date. The lists are not intended to be merely the references consulted by the authors, although many of those are included, and their aid is acknowledged with gratitude. The purpose of these lists is to suggest some of the more recent and authoritative

general works in each field. In these the instructor or the gifted student may find supplementary reading with which to broaden his understanding of the subjects considered.

The indebtedness of the authors for valuable suggestions, illustrations, and other kinds of aid extends in many directions and to numerous individuals. This cordial cooperation is much appreciated.

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# Chapter I. The Field of Geography: Its Content, Method, and Point of View

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## Definition of Geography

1. Geography is the science of the earth's surface. It consists of a systematic description and interpretation of the distribution of things on the face of the earth. (As the geographer conceives of the surface of the earth, it is in the nature of a thin shell that extends slightly above and below the surface proper.) It is in this thin zone of contact between the atmosphere above and the solid and liquid sphere below that life in its various forms exists. Here organic and inorganic forms are closely intermingled and intimately interrelated, and from their combined patterns of distribution there emerges an earth's surface of variegated form and color.

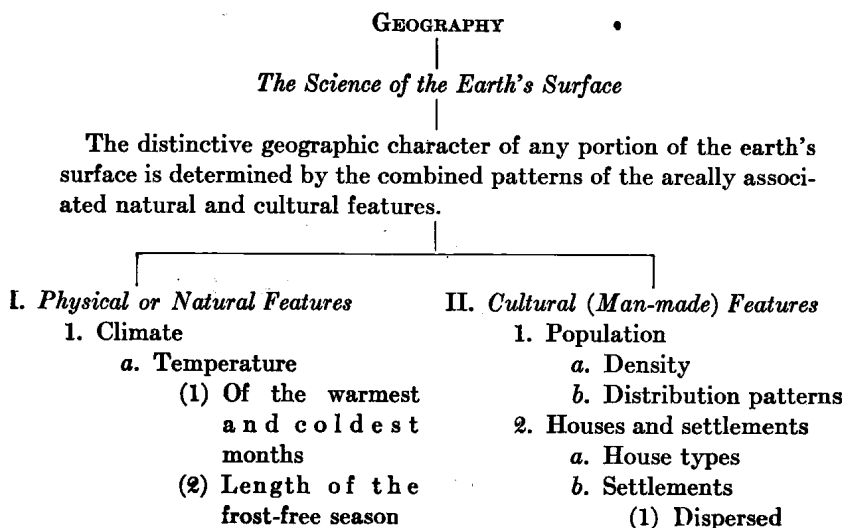
## The Geographic Features of the Earth's Surface

2. PHYSICAL AND CULTURAL FEATURES. It may be asked, "Specifically what is it about the earth's surface that the geographer studies?" Essentially it is the two classes of interrelated features noted in the preceding paragraph: (a) those which are provided by nature (among them, climate, surface configuration, soils, economic minerals, surface and underground water, and native plant and animal life) and (b) those which man has added through living on the earth and using its resources (population, houses, settlements, communications, farms, factories, mines, etc. These two groups are designated as the *physical* or *natural* features and the *cultural* features. The latter are composed chiefly of the *material observable features* resulting from man's productive activities in earning his livelihood, and from his creation of shelter buildings and means of communication. These are the cultural features of primary importance. Some would add to these, other less tangible aspects of human development, cultural and political, which are closely associated with the material features.

In addition to the distinctly man-made, or cultural, features, there are others of natural origin which have been modified by human beings. Cultivated soils, for instance, are not exclusively either natural or cultural, and the same is true of much of the earth's vegetation cover. *These material features, of both natural and human origin, are the elements of geography*, and it is with them that the present volume is concerned.

It is not, to be sure, in the numerous *individual* features of the earth or its regions that the geographer is primarily interested. Simply a catalogue of individual plants is not botany, nor is the listing of things to be seen within any portion of the earth's surface geography. Scientific study requires grouping and classifying and the tracing of origins and connections. When it is noted, for instance, in a study of the geography of an area, that there are *repeating patterns* of population distribution, drainage lines, fields, or any of the other very numerous features, and when these repetitions are discovered to have definite causal relation to other features (past or present) with which they are areally associated, there is then the beginning of scientific geography. The classifying of the regional features according to origin, function, or some other basis into groups and the revealing of the bonds of connection between them are the geographer's task. Characteristic and repeated *patterns* and *associations* of features, then, rather than individual features are most useful in understanding the geography of the earth's surface.

The following diagrammatic outline may help to clarify the preceding analysis:



- b. Precipitation
      - (1) Total annual amount
      - (2) Distribution throughout the year
      - (3) Reliability
    - c. Type of climate
  - 2. Surface configuration and drainage
    - a. Earth materials—nature of underlying rock
    - b. Principal landform groups—relief and slope characteristics
      - (1) Plains
      - (2) Plateaus
      - (3) Hill country
      - (4) Mountains
    - c. Surface features of a smaller size
    - d. Drainage
  - 3. Earth resources
    - a. Water resources of the land
    - b. Native vegetation and animal life
      - (1) Forest
      - (2) Grass
      - (3) Shrub
    - c. Soils
      - (1) Physical and chemical properties
      - (2) Character of profile
      - (3) Soil type
    - d. Economic minerals
- (2) Agglomerated
- 3. Features associated with production
  - a. Agriculture
    - (1) Size and layout of farm and fields
    - (2) Crop or animal specialization
    - (3) Distribution pattern of agricultural land
    - (4) Types of agriculture and their world distribution
  - b. Manufacturing
    - (1) The industrial plant
    - (2) Raw materials, power resources, and finished products
    - (3) Manufactural regions of the world
  - c. Extractive industries
    - (1) Logging
    - (2) Fishing
    - (3) Hunting and trapping
    - (4) Mining
- 4. Features associated with transportation
  - a. Routes of travel—density and patterns
  - b. The carriers
  - c. The things transported—foreign and domestic trade

3. *Description and Explanation.* As in many other sciences, so in geography, careful, systematic, direct observation and description are preliminary to and necessary for any classification and explanation that may follow. The geographer, in his study of any region of the earth or of any single geographic element, first of all systematically observes and then records, usually on a map, the results of his obser-

ventions. Unlike most scientists, a geographer needs to describe and understand things that are much larger than his range of vision. The microscope is of little or no use to a geographer. His problem is to bring the patterns of widespread and far-flung features, distributed over countries, continents, or even the world, within his range of study. He must see them in their relations to each other, and to do this he is obliged to reduce them to observable size on maps. Maps, then, with their great variety of symbols, become the technical language of geographers. No other science, social or natural, makes use of them to anything like the same degree.

The second step, following observation and description, is the search for explanations as to why the patterns of distribution are as they are. No limit is placed upon *kind* of explanation. The physical earth, or natural environment, is only one of a great variety of things affecting man's use of a region, and it holds no preferred position among the several influences. There is, to be sure, no attempt to minimize the importance of the natural equipment of a region in its effects upon land use. But historical antecedents, customs and habits, laws, tariffs, and multitudes of other social forces likewise influence the character of land use, and they are as "geographic," as far as explanation of the cultural scene is concerned, as is a coal field, a mountain barrier, a soil type, or any other feature of the natural earth. In other words, the things studied are restricted but not the type of explanation.

4. GEOGRAPHY NOT EXCLUSIVELY EITHER A NATURAL OR A SOCIAL SCIENCE. Since the earth's surface, which is the focus of a geographer's study, is composed of natural as well as of cultural features, it is obvious that geography cannot be exclusively either a natural or a social science, but belongs to both. It is inherently dual in character. If one studies a region in its totality, he is compelled to deal with both (a) its natural equipment and (b) the human imprint upon it, and such is the nature of most regional studies.

*Physical Geography.* It is entirely feasible, however, for one to study the patterns and associations of the natural features while ignoring the cultural, and there is a group of geographers that chooses to cultivate this more restricted physical aspect of regions. But many times physical geography has a humanized perspective, for it is often an analysis of the whole natural equipment of a region, or some element of it, in terms of its resource potentialities for human use. Such a study provides a solid foundation not only for cultural, or human, geography but for all the other social sciences as well. The associated original natural features of a region, unmodified by human beings, are designated as the *fundament*.

*Cultural, or Human, Geography.* On the other hand, one may, if he chooses, focus his principal attention upon the man-made features of a region, while minimizing, although certainly not ignoring, the physical aspects. The thing to be understood is still the earth's surface, but it is the surface as modified by the human beings living in and using the region. Human geography thus becomes a study of the "culture surface" and as such is a social science, claiming a place along with history, economics, anthropology, and others in an investigation of the human record. However, geography is concerned not primarily with human relationships, but rather with the features that man has inscribed upon the earth's surface, including population. The data of cultural geography are chiefly forms of land utilization. These features of human origin within regions rest upon, and grow out of, the earth's physical surface. But in no sense is the physical surface to be thought of as the sole cause of the character and distribution of material culture. It is the human group, with its particular heritage of racial endowments, customs, habits, and training, that creates the features of land utilization, and it is the human element also that largely determines their character and distribution. Physical conditions set up only certain very flexible limits to land use.

5. *Regional and Systematic Geography.* The features that exist together on the earth's surface may be studied in a number of ways. Probably the most logical way to study them is in their natural groupings, *i.e.*, by *regions*. The face of the earth may be thought of as composed of a mosaic of regions differing from one another in their natural and man-made (cultural) features. In other words, each region has individuality or distinctiveness by reason of the kinds and arrangements of the features that occupy its surface. To delimit these regions, to describe and explain their distinctive characteristics, and to understand the bonds of connection between them—this, according to many geographers, is the core of their science.

It is possible, however, to study geographic features in their *systematic* rather than their regional groupings. By this method landforms, climates, human settlements, manufacturing types, crops, and the like may be made the subject of observation, description, classification, and explanation. In the evolution of geographic science many of the systematic groupings which it formerly included and cultivated have been partly or even largely taken over by more recently developed sciences. Thus to the mother science geography was born a group of offspring—geology, botany, zoology, meteorology, climatology—and each attained independence by taking over a part of the parental estate and successfully cultivating it. Nevertheless

many qualified geographers still work successfully in the several branches of systematic geography and their bordering sciences.

6. THE PRESENT BOOK; TITLE, CONTENT, AND ORGANIZATION. If the position is taken that geography is primarily concerned with a study of the earth's surface, it remains to be pointed out what particular contribution to that study this book is intended to make. It is in the nature of an introduction to geography through a systematic study of the individual elements or features that together comprise the face of the earth. The title of the book suggests this content. In no sense is it intended to be a general summary of geographic knowledge. On the contrary, the purpose is to acquaint the beginning student with the fundamentals of geography and to offer suggestions as to how they may be used in the understanding of the earth's surface. It is more in the nature of an outline of geography, the content of which provides organization and factual material on the physical and cultural earth.

Various methods have been employed by different authors in making this introductory approach to geography. One very common way has been through the channel of formal physiography, in which emphasis usually is placed upon a study of such physical *processes* and *agents* as rivers, glaciers, weathering, diastrophism, and storms. Less attention is given to physical *features*, their regional associations, potentialities for human use, and their world distribution. Some other books minimize the treatment of physical processes and emphasize instead the characteristic human developments within the several great physical realms of the world. Still others are condensed compendiums of information summarizing the whole field of geographic knowledge. As stated in the preceding paragraph, this book makes the approach to the study of earth regions through a treatment of their observable material features, these being the principal elements of geography.

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