

ECOLOGICAL GEOGRAPHY

BY
THOMAS BERRY

GEOGRAPHY IS AN INTEGRATING STUDY OF THE EARTH IN ITS comprehensive extent as well as in its various regional integrations. It does, however, need the other sciences for the specific data that they supply. Geography needs geology for understanding the structure of the land and the formation of the mountains and the rivers; biology for the study of life-forms; meteorology for understanding the weather of regions that make a region suitable for particular forms of vegetation; hydrology for understanding the rivers, lakes, and aquifers, and forestry for the study of the wooded areas.

While geography provides a comprehensive context for understanding the functioning of the Earth in its larger structure, it is even more useful in appreciating the integral functioning of the various regions into which the planet is divided. In this manner it provides the context for ecological understanding.

Earth, we might say, is a single reality composed of a diversity beyond all understanding or description. This diversity in its arctic and tropical regions, its oceans and its continents, in its mountains

and valleys, its forests and deserts, its rivers and their floodplains, all give to Earth both its endless wonder and its functional integrity. These landscape features and these living forms have come into being as some self-woven tapestry or some self-composed symphony or some self-designed painting. To experience this wonder and to enter into intimate relations with the various life communities of these regions seems to be the high purpose of human presence on the Earth.

Prior to the emergence of humans the Earth, with the rise and fall of continents, their coming together and their drifting apart, with the sequence of geological layers in the formation of the continents, with their volcanic eruptions, forests, and wildlife, with all these apparently destructive experiences, has remained coherent and creative throughout the vast period of its development.

That the geological structure of Earth and the number of life species should be so vast, so diverse, and their interaction so intimate is the wonder of the known universe. No other planet has, so far as we can determine, anything beyond minimal indications of any possible life, much less such magnificent forms or such diversity of species. Even after all these years of scientific inquiry into the structure of the planet and its life systems, our knowledge of the forces creating the physical contours of the planets, the sequences of climate change, and the disposition of species inhabiting this planet is still quite limited. While we know more than a million and a half species we estimate that there are at least ten to twenty million or even more species occupying the Earth. The interaction of these species with their geographical location constitutes a major phase of land formation.

Then came the human, a being with a genetic mandate to shape a cultural mode of being of its own design but with a dependence on all the other forces shaping the continents. This power of self-shaping is possessed by all living beings, but in relation to other modes of being and within controlled limits, which have come to be designated as the species "niche." Geographical context is among the most

powerful determinants in enabling the human to establish its place in the community.

The variety of regions where a single species might dwell was vastly expanded by the type of intelligence granted to humans. While intelligence enabled humans to adapt more extensively to the outer world, this same intelligence gave to humans the capacity to fashion for themselves a variety of inner cultural worlds. These cultural realms would constitute not only the inner determination of the human, they would also determine the relation of humans to the other modes of being. In a special manner humans, in their adaptation to geographical environment, would require a conscious understanding of the place of their dwelling.

Several million years were needed before humans could fully shape their identity within the geographical context in which they found themselves. Then it required another long period of time for humans to relate effectively to the other members of the surrounding community. This capacity took its most significant step with the cultivation of the land and the confining of animals. From that beginning some ten thousand years ago this capacity increased, at first gradually, then with ever-accelerating impact on the biosystems of the community. Eventually the achievement of a truly human way of life came to be judged by the extent of control over the geological structure, the vegetation, and the wildlife-forms in the region and their use for human purposes.

What also distinguished the human mode of being was the sense of spirit powers present throughout the geographical region. The rivers and mountains were not simply physical forms, they were spirit powers to be reckoned with. The sense of relating to spirit powers identical with the topography of the region established one of the specific differences in the human adaptation to regional context and to other life-forms. It also provided the intense emotional attachment for human communities to the place of their dwelling.

In recent times what industrial civilizations have failed to realize

is that in the particular place of their dwelling the well-being of the Earth was a necessity for their own well-being and fulfillment. The attitude that the Earth existed for utilitarian human purposes became progressively severe as commitments to the individual rights of humans were enacted into political constitutions with no corresponding rights being recognized for the other components of the natural life community. Legal enactments gave to humans what were designated as "property rights" over land and whatever existed on the land. Such enactments provided the basis for occupation and unrestrained exploitation of the land. Western civilization, dominated by a cultural arrogance, could not accept the fact that the human, as every species, is bound by limits in relation to the other members of the Earth community.

While refusal of any other members of the Earth community to accept limits might quickly lead to extinction of the disturbing species, humans found that they could, for a period of time, subvert the forces that might normally lead to their own extinction. What humans could not do was to avoid the degradation in their own mode of being that occurs as soon as they prevent the other members of the community from fulfilling their role in the larger Earth community. Only gradually have modern humans in the Western cultural tradition begun to realize that we have a profound need for the well-being of other species if we are to experience any well-being or fulfillment in ourselves.

In these opening years of the twenty-first century we need to renew our intimacy with our local bioregion and with the North American continent but also with the planet Earth itself, in its comprehensive extent and in the diversity of its component regions. To accomplish this intimacy in some integral manner we require a study that would fulfill the ideal of a "total earth science" that was spoken of so frequently by Robert Muller, a former adviser to several secretaries-general of the United Nations from the 1950s until the 1970s. This phrase, total earth science, seems to have the comprehensive extent and the precision in

statement needed in designating an area of understanding that has never been given its proper identity or its proper place in our educational program.

This lack of attention to an integral Earth study is one reason for the difficulty humans experience in finding their place within the dynamics of the Earth. Some beginnings in understanding have been made in studies of the Earth in terms of the Gaia hypothesis. This refers to the Earth as having the capacity for *homeostasis*; that is, for comprehensive inner adjustment and self-regulation in response to changes in the outer world. This concept has led to macrophase biological studies of the landsphere, the watersphere, the atmosphere, the life sphere, and the mindsphere as the five macrophase components of the Earth.

This way of thinking about the planet provides an integrating context for all our particular studies. It provides a way of understanding and managing the complexity and tensions that exist amid the vast array of forces that enable the Earth to be the wonder planet that it is. It enables the human community to begin thinking more adequately of its own role. In recent times our human role has been profoundly altered due to the powers attained by the human community through the sciences and technologies that have been developed in the twentieth century. Humans are now altering the planet on a scale that can be compared with the glacial periods in the influence that they are now having on the planet. Our capacity to extinguish life-forms has even been compared with the forces that terminated the Mesozoic and introduced the Cenozoic eras in Earth history some 65 million years ago.

It is difficult to appreciate the full extent of the power possessed by industrial civilizations to disrupt the integral functioning of the life systems of the Earth. A new geobiological age has been introduced. This requires new perspectives in those studies that are concerned with the integral functioning of the Earth: geology, chemistry, biology, and those other studies of the Earth and its manner of functioning. In

all these areas the natural systems have been profoundly affected by the new powers of the human community.

Here we must once again refer to the fact that humans are different from other species in establishing their self-identity and in identifying their role in relation to the other components of the Earth community. To some extent this entire book can be considered an effort to identify the role of the human community in relation to the other components of the planet. While this effort can be understood as the search for the proper niche of the human, it is a special form of niche. The other-than-human species, through their genetic endowment, discover their survival context with only limited disturbance of the larger complex of life systems. They find their niche quickly, or else they perish. A certain stability eventuates. A new equilibrium comes into being, a functioning relation of things with one another.

The difficulty with humans is that we are genetically coded toward a further transgenetic cultural coding whereby we establish ourselves in our specific mode of being, a cultural mode of being that we hand on to succeeding generations by education. Through this cultural mode of being we also establish our niche in the Earth community. Our place in the community is more extensive in its habitat region than is the case with other modes of being. Whereas other life-forms generally survive only within a limited bioregion, we can establish our human presence almost anywhere on the planet.

In some sense the human refuses to accept any particular niche, for the basic function of a niche is to set limits to the activity of a species. In this sense the human refuses to accept limits imposed from without or even from within its own being. By bringing humans into existence the Earth has created a supreme danger to all other components of the Earth community because the human can invade the region of other species with a unique range of freedom.

Survival of any group of living beings in relation to other groups depends on the recognition of limits in the actions of each group. This law of limits is among the most basic of all cosmological, geological, or

biological laws. It is particularly clear in the case of biological forms. In the Hindu world this law of limits is recognized as *rita* in the cosmological order or as *dharma* in the moral order. In the Chinese world it is *tao* in an earlier phase or *li* in the later neo-Confucian period. In the Greek world it is *dike* as the order of justice or *logos* establishing the intelligible order of the universe. Yet in the modern world this sense of limits imposed by the natural functioning of the universe has to some extent been overridden, at least in a temporary manner, by industrial processes created by humans.

The general law is that every species should have opposed species or conditions that limit them so that no single species or group of species would overwhelm the others—something that would assuredly happen if even a bacterium were permitted to reproduce without limitation over a period of time. The law of limits is what makes the functional rapport between the various life-forms an urgent necessity.

That is the difficulty for humans. We must self-limit. We have such an extensive range of abilities in relation to the other components of the planet that we seem not to know where to place the limits on our actions. Or perhaps we are simply unwilling to limit ourselves by deliberate decision. To some extent this derives from our partial emergence out of the controls of instinct when we acquired the capacity for intelligent thought. In the twentieth century we have been so entranced with our evolutionary origins and the long series of transformations that have brought us into being that we are more attracted to cosmogenesis than to cosmos. Even as regards Earth we are more committed to history than to geography, more committed to time than to space. History is endless. Place is limited.

We are so impatient with our given place in the universe that some persons are totally committed to discovering how we can get beyond Earth. We have indeed been out in space, but some are under the illusion that we have been off Earth. In reality humans have never been off Earth. We have always been on a piece of Earth in space. We survive only as long as we can breathe the air of Earth, drink its

waters, and be nourished by its foods. There is no indication that as humans we will ever live anywhere else in the universe. Place, too, is continuously being transformed but only within its own possibilities.

Our entire industrial system can be considered as an effort to escape from the constraints of the natural world. We have created an artificial context for our existence through mechanical invention and the extravagant use of energy. In this process we have so violated the norms of limitation, so upset the chemical balance of the atmosphere, the soil, and the oceans, so exploited the Earth in our use of fossil fuels, that we are devastating the fertility of the planet and extinguishing many species of wildlife. We no longer live within the organic, ever-renewing world that is the natural context of our existence.

When we awaken to a realization that the industrial world, as now functioning, can exist for only a brief historical period, we might begin to consider just how we can establish a more sustainable setting for our physical survival and personal fulfillment. We must, obviously, turn from our exploitation of the natural world to consider once again just how the planet functions and where we belong in relation to the other components of the planet. Since we do not function primarily by instinct, we can do very little until we have some idea of how the life systems of the Earth function in producing the food and shelter and the energies we need. In some sense this is a recovery process, since in our agricultural phase we had an abundance of knowledge of how the Earth functions in its various bioregions.

Now, however, we need a much more comprehensive type of understanding and a more extensive human adaptation to the various bioregional contexts of our dwelling. While we need this intimate acquaintance with the organic functioning of our local region, we also need a larger sense of the Earth. We have become so conscious of the planetary context of our lives that we cannot completely withdraw into the local region.

However resistant to the restraints inherent in their nature, humans in the natural order of things belong to, are possessed by, and

are subject to the geographical place where they reside. Yet through technological skills humans have become less dependent on their immediate geographical region. We have come to consider that we become more human the more extensively we withdraw from any dependency on our bioregion. Our present alienation is such that we have little concern for where our food comes from—whether it is grown in North America, Africa, Australia, or South America. Our clothing could be made from raw materials grown in one country, shipped to another to be tailored, and then shipped abroad to be sold somewhere, anywhere. There is little or no relation to the fields that grow our food, to the streams that provide our water, to the woodlands that surround us, or to the regional flowers or fauna. Moreover, there is frequently exploitation of the labor of those who grow our food and make our clothes.

This psychic world of no attachment, no intimacy, is also the world of no fulfillment. There is effectively no feeling of intimacy with our place. While we expect our place to give itself to us, we have no sense of giving ourselves to our place. Regional feeling or understanding has become an irrelevant intellectual discipline. It is given little attention in the education of children. If geography is included, it is political or economic geography for human purposes, not for the purposes of the larger Earth community. Yet as population increases and available space on the planet becomes more limited, the study of Earth and its regions becomes more critical. Economic geography needs to discover where the living resources of the Earth are located in each bioregion, how abundant are these resources, how they are best sustained in their capacity for unlimited renewal.

The founder and most distinguished of the modern geographers, the one who designed new ways of thinking about and recording the structure and functioning of the planet, was Alexander von Humboldt (1769–1859). Based on his studies in South America he provided an overview of the geological structure, the climatic conditions, and the vegetation of that region. Then he ventured into wider studies of the

geological structure and functioning of the European, Central Asian, and American worlds. These studies he published in twenty-two volumes. His best-known work, however, is *Cosmos*, published in English in five volumes (1845–1862), the first great treatise on modern geography.

Humboldt was followed by the French geographer Jean-Jacques-Elisee Reclus (1830–1905) with his central work *La Terre* (1868–1869). Eduard Suess (1831–1914), a contemporary of Reclus, wrote as his principal work, *Das Antlitz der Erde (The Face of the Earth)* in five volumes published in English in 1883–1909. These early geographers were followed by such scholars as Frederick Ratzel (1844–1904) and by a series of French scholars who were mostly interested in regional geographies.

These are the sources from which geographical studies emerged in America at the end of the nineteenth century. Isaiah Bowman (1878–1950), director of the American Geographical Society for twenty years, had a primary interest in geography in its relation to the social sciences. Among his special interests were the Andes regions of southern Peru and northern Chile. Carl Sauer (1880–1975) did special studies of the desert regions of the southwestern areas of the North American continent. His studies included the human geography of the American Indian and also the early agriculture of Mexico. These terms, *ecology* and *geography*, were brought together as early as 1923 in H. H. Burrows's presidential address to the Association of American Geographers, which was entitled "Geography as Human Ecology." Ellsworth Huntington (1876–1947) did a comprehensive study of the Earth and its influence on human formation in his monumental study *Climate and Civilization*, which was published in 1915. Since this last part of the nineteenth century and the first half of the twentieth was the high period in the imperial dominance over the Earth by the Western powers, it was also the time when support for political-military dominance of the world was sought in geographical considerations. This led to the views of the American naval officer

Alfred Thayer Mahan (1840-1914) concerning sea power, set forth in his study of *The Influence of Sea Power upon History, 1600-1783*. Global strategies based on the land came into being through Sir Halford John Mackinder (1861-1947). He established geographical studies in England as an academic discipline at the London School of Economics while developing his theory of the land basis of power in Eurasia as the geographical heartland of the Earth and of human history, a thesis that he presented in an essay in 1904.

Although these uses of geographical data are immensely important in understanding past history and the forces that have brought us to our present world situation, we must move on to other concerns. We are now more concerned with the influence of human civilizations on the climate than with the climate's influence on human civilizations.

While cultural geography, economic geography, political geography, and military geography have served the purposes of human exploitation of the planet, the time has come to study the Earth for the purposes of the Earth. The well-being of the Earth depends to an extensive degree on our understanding of the planet in its global extension, in its bio-regional diversity, and in the intimacy of the component parts in the whole. We depend on this understanding of the Earth in all its diversity if we are to know how humans are to be presented to the planet in some mutually enhancing manner. Such understanding is the proper role of ecological geography. If this study were properly developed then a great advance will have been made toward achieving a viable planetary community.

Our present concern for the human venture in its relation to the natural systems of the planet is sometimes referred to as the "human *problematique*" or as the "global *problematique*." In either case the issue is the same. For we have a comprehensive Earth issue as well as a vast diversity of human issues with which to deal. In both instances some sense of the planet Earth as the intimate place of our dwelling needs to be fostered. The phrase "world *problematique*" has been extensively used in discussions such as those begun in the 1960s by

the Club of Rome in the first extensive survey of our human future in light of the extreme demands we are making on the resources of the planet. This was the issue dealt with in the *Limits to Growth* (Meadows et al., eds., 1972), a study of the resources of North America and of the larger planet for purposes of long-term planning for a future human economy. Even the title of this book aroused antagonism throughout the commercial world as well as in the academic world. Its thesis—that we are imposing burdens on the Earth that are beyond Earth's carrying capacity—remains a powerful critique of the industrial-commercial-financial world of the twentieth century. Another such study, *Global 2000: A Report to the President*, was requested by President Carter in 1979, the last year of his presidency, for guidance in establishing long-term economic strategies for this country. The report came to the same conclusion and evoked similar resentment. While President Carter was aware that human intrusion into the planet's functioning was reaching the Earth's limits of sustainability, the succeeding president, Ronald Reagan, objected to the report and suppressed its printing by the Government Printing Office.

In resolving our present impasse, ecological studies are providing much-needed guidance. Indeed the term ecology is becoming a prefix that can be attached to almost any science or to any human activity. So we find ecological studies in their relation to law, economics, education, literature, ethics, and a large diversity of other aspects of the human project. In the future none of these activities will be able to proceed without a better geographical context of understanding the planet.

The more humanistic realms of poetry and the natural history essay are important to establish the emotional-aesthetic feeling for the wonders of the natural world and to awaken the psychic energies needed for dismantling our present destructive technological-industrial-commercial structures and creating a more benign mode of economic survival for the entire Earth community. But these humanistic insights are themselves ineffective unless they are enhanced by

a more thorough understanding of the identifying features and intimate modes of functioning of bioregional communities.

The understanding of the Earth that we are indicating needs to be something more than a composite of these multiple ways of viewing the planet. For the present this idea of a total or integral Earth study seems implicit in what we presently designate as ecology. Another term coming into use is *Earth literacy*, as a basic context for educational programs from the earliest years through professional levels. Earth literacy is being fostered especially by educators such as David Orr of Oberlin College and Chet Bowers of Portland State.

Each of these terms has its own special value. My own expectation is that the study of ecological geography will have a significant role to play in the future as one of the most effective disciplines leading to an integral human presence to the larger Earth community. This presence will occur, however, only when the study of the Earth gives rise to an appreciation such as that given expression by John Muir in his writings on the Yosemite Valley in California.

What is needed is geography as an intimate study. Just as there is an affection between animals and humans, so there is an affection that passes between the region and human appreciation. Nothing escapes the role of intimacy. There is such a thing as considering the curvature of space as an intimacy of the universe with every being in the universe. So with the bioregion, there is an intimacy that brings to fulfillment both the region and its human presence. The region responds to the attention it receives from the various members of the community.

This feeling relationship with the Earth intensifies as we grow in familiarity with the region. As described by Barry Lopez in his essay on American geographics, "The more superficial a society's knowledge of the real dimensions of the land it occupies becomes, the more vulnerable the land is to exploitation, to manipulation for short-term gain. The land, virtually powerless before political and commercial entities, finds itself finally with no defenders. It finds itself bereft of

intimates with indispensable, concrete knowledge" (Lopez, *About This Life*, p. 137).

Indigenous peoples know their region. They must know where the food is, where water is available, where firewood is found, where the medicinal plants are, where the trees grow that furnish the poles for their tents or the wood for their fires. Our studies in what we call ecology must lead to such intimacy with our natural surroundings. Only intimacy can save us from our present commitment to a plundering industrial economy.