and certainly confusing, that adherents to each of these contrasted points of view may be identified as regional geographers. Minshull reports on a few geographers who have tried to bridge the alleged gap between the regional and the topical approach, but he also reports at great length on the writings of those who accept the dichotomy between these two approaches as real and inevitable.

A review of the ten chapters of this book serves to indicate the kind of coverage that is offered. The opening chapter discusses the regional method of description, and this is followed by a review of regions as real objects. Then come chapters on formal and functional regions, the ranking of regions in a hierarchy, regionalism, the nature of regional geography, alternatives to an inadequate concept, the influence of methods of mapping, and the compage. In his conclusion he compares the "traditional region" with the compage, indicating his own preference for the more flexible, map-oriented compage. He also concludes that geography is not a natural science. "If we shake off this embarrassing disguise," he writes, "geography will lose all those who need the order, orthodoxy and safety of a natural science to which to cling, and will be definitely better off for the loss." Geography, he insists, is the subjective, artistic description of the earth as the home of man.

One gets a blurred and out-of-date picture of regional geography from a reading of Minshull's book. The day when geographers argued about whether the facts of man's use of the land could be made to coincide with the facts of the physical earth has long since passed—although apparently there are some who still worry about such a question. Perhaps there are some who still start the description of a country or continent with a treatment of structure, landforms, and climate before introducing a description of man and his activities. Perhaps there are, in fact, some textbooks in which the use of regions is only a convenient framework for the organization of a standard set of facts. Minshull correctly suggests that such books are dull, especially as compared with the historical treatment of human events. But the author nowhere comes out clearly with the charge that such "traditional regional geography" is today entirely unacceptable, either in theory or in practice. One does not get the picture of the region as the momentary reflection of on-going processes of change and innovation, or that the patterns of change are of greater significance than the static regions. The idea that the recognition of homogeneous or nodal regions is a method for revealing recurring regularities among complex phenomena does not emerge clearly, nor does the idea that such recurrences have a mathematical basis, and can best be described through the application of mathematical theory. In fact the author expresses his horror at the

notion of mass data-processing. Yet the fact is that the use of a computer is no job for an "unimaginative hack." It may well be that the mathematical approach to the description of the processes at work on the earth and of the covariance among things and events associated in segments of earth-space may require much subjective judgment and imagination. The conclusion does less than justice to regional geography in the 1960's.

Preston E. James

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In June, 1955, the Wenner-Gren Foundation sponsored the International Symposium on Man's Role in Changing the Face of the Earth. The published volume of papers and proceedings of that conference, edited by W. L. Thomas, Jr., has since been a standard reference. The present volume is similar. The conference was held in April, 1965, under the sponsorship of the Conservation Foundation and the volume contains 34 papers plus a largely verbatim transcript of the discussions. The two books have a very similar flavor; both include a variety of generally high-quality papers; both discussions were wide-ranging and offer sharp contrasts between the pedestrian and the sublime in-close juxtaposition; both are highly stimulating, have significant gaps, and lack continuity. The similarities even extend to closing statements by Lewis Mumford and to the inclusion of a piece of Kenneth Boulding's verse at the end. Boulding is not as good a poet as he was ten years ago!

The differences between the two volumes are more interesting and significant. Man's Role places greater emphasis on the past; its view of man has an anthropological bias and the whole planet is grist for the mill. Future Environments looks strongly toward the future; its view of man is broadly as an ecological agent and the scope is confined to North America which appears nevertheless to include the United Kingdom.

Such volumes are not suitable for reading from cover to cover, but they do provide, by means of a non-random sample, an extract of current thought and climate of opinion. The changes over a ten-year period as reflected in the two volumes include a diminished concern with the availability or potential scarcity of natural resources; a greater popularity of the
broader "environmental" approach than the narrower "resources" view; a greatly increased concern about qualitative changes in the environment; a stronger contribution by economists; a greater skepticism about the value and relevance of economic criteria and guides; a more vigorous effort to apply research to improving public policy; and a stronger sense of humility and awareness of the limitations of present (and perhaps future) knowledge. Ten years ago the concern about natural resource scarcity was still rampant. The pessimistic conservationists and neo-Malthusians made dire predictions, but at least they knew (or thought they knew) the answers. Today it is increasingly recognized that we are not able to specify with precision what the consequences of our application of new technology to the environment will be, and that great uncertainty attaches to almost all available choices.

The papers in *Future Environments* are arranged into six groups on (1) the relationship of the organic world to environment, (2) four distinctive regional environments, (3) economic patterns and processes, (4) social and cultural purposes, (5) regional planning and development, and (6) organization and implementation. In the first group the papers center on problems of preserving the habitats for particular species, the prevention of species extinction, and the adaptability of animals to changing habitats. An interesting paper by Paul Waggoner raises the problem of the possible consequences of weather modification for landscape (Can the geomorphologists state precisely how and at what rate landforms would change given a specific increase in precipitation?), and how landscape change would affect animals and plants.

Geographers Ross Mackay (Tundra and Taiga) and Gilbert White (Arid Lands) contribute some stimulating ideas to the second group of papers on particular regions. Mackay shows that the northern environments are delicate and fragile and easily disturbed by the relatively light touch of a sparse human population. White is concerned with factors affecting the choice of alternative uses of the arid environment. Water as a limiting factor is of declining importance and the perception of the resource manager is a major aspect of the decision process.

In group three, Kenneth Boulding describes five basic similarities between economics and ecology and then goes on to castigate the ecologists as "a bunch of bird-watchers." "You don't have any sophisticated knowledge in ecology," he tells them, "the ecological point of view is an integrating point of view for all science, social and physical ... you are missing an enormous opportunity in the schools."

Avers Bräuner discusses the economic criteria available for investment decisions in resources, and concludes that the position has not greatly changed over the past ten years. He favors incremental planning, at the risk of missing the great opportunities, over comprehensive planning, which because of the difficulties of prediction leads to major inefficiencies and precludes better choices in the future. Marion Clawson writes about Americans allocating their time among various activities and concludes that competition for the time of people is going to become more acute than competition for income. Joseph Fisher discusses the need to understand the interplay of events with policies and policy objectives and repeats the R.F.F. findings that there are no short-run problems of resource scarcity in North America (except in a few isolated instances), but that there are severe qualitative problems. Dick Meier is off in his usual speculative dream-world, this time building cities on the sea with Doxiadis (cost level only 50 per cent higher than middle-class suburbs and declining).

The five papers on social and cultural processes include a reflective contribution by Clarence Glacken on the man-nature theme as a subject for study. Glacken cautions against "monolithic summation." For example, while Western civilization has been characterized by a dichotomy between man and nature, much thought also shows the unity of all nature, including man. Seymour Farber's paper on stress and creativity includes an interesting tom-tom sketch of the highly stressful experiences of the modern American housewife. He concludes that a certain amount of stress is good for you.

The last two sections touch on some of the more immediately practical and policy concerns of how to plan and develop the environment for man and how to organize for implementation. There is also a most useful paper by Pierre Dansereau listing in an appendix "the laws of ecology" and specifying five integrative levels of environmental processes and relationships. There are three contributions by British geographers. Peter Hall describes the manner in which urban growth has been circumscribed in the United Kingdom; Robert E. Dickinson describes the likely outer limits of urbanization over the next few decades; and J. A. Steers discusses the vulnerability of the seacoasts and the pressures on them for development.

The justification for publishing a book of this kind must be that it permits others to share vicariously in the intellectual stimulus and heady atmosphere of a conference of high-level experts drawn from many disciplines. By this criteria *Future Environments* is a great success. The conference was evidently a most happy event and the reader's appreciation is enhanced by the editor's thoughtfulness in printing many of the aside remarks and repartee. More than one speaker is told (usually by Boulding) that he is talking nonsense, but in dealing with the Future Environments of North America we have now no reliable way of knowing which ideas are likely to be proved foolish and which wise. One conclusion emerges clearly above all
others. A major increase in research effort is needed, not only by ecologists but by others working from an ecological point of view, in an attempt to provide a much sounder basis for the sweeping judgments which abound in this book.

IAN BURTON

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This collection of 11 papers, presented early in 1964 at Southern Illinois University, Carbondale, serves to highlight one of the major issues of our times—urban sprawl. The volume examines the forces behind urban sprawl and the effects of sprawl on the city as a whole and on the characteristics of today’s urban life, and it emphasizes the need for plans to control the phenomenon.

Several attempts are made at defining urban sprawl, but as Dickinson points out in his paper, “The Journey-to-Work,” one of the basic questions yet to be answered is, “What shall be the precise definition or sprawl and, in consequence, the areas it covers in its various forms?” Most of the authors agree, however, that the term connotes a negative aspect of urban growth that needs to be remedied, or controlled.

The 11 papers are grouped into five sections. The first consists of an introductory statement of the problem of urban sprawl and of its ramifications by Jean Gottmann, in whose honor the conference at Carbondale was held. Part Two, about which more will be said, consists of four papers dealing with the forces, pressures, and form of urban sprawl. Part Three recognizes that flow and movement are implicit in the idea of sprawl, and that fringe growth is closely tied to transportation and traffic. Included in this section, in addition to the paper on “The Journey-to-Work” by Robert Dickinson, are papers by Robert Ledermann on “The City as a Place to Live”; Bert Epstein on “The Trading Function,” and James Kenyon on “Manufacturing and Sprawl.”

Dickinson looks upon sprawl as existing in areas in which there is a lack of coordination between built-up areas, urban utilties, access to central-place services, and the journey-to-work. He claims that there is real need for more compact and larger urban groupings covering less area with more urban amenities. Ledermann advocates the planned unit development as an effective way to control sprawl. This is a means of including within a single community a variety of residential dwelling types, plus related uses and amenities, free from the usual restrictions on lot sizes and setbacks. Epstein recognizes two types of commercial sprawl—consequent commercial sprawl and catalytic-commercial sprawl—and notes their relation to areal spread of urbanism. Kenyon presents an analysis of the extent of the outward migration of industry, effects of this outmigration on communities, and advantages of industrial districts.

Part Four is composed of a single paper by Jean Gottmann elaborating on his ideas of “The Skyscraper Amid the Sprawl.” Part Five contains two very worthy papers: the first on “Sprawl and Planning” by Henry Fagin, Department of Urban and Regional Planning, University of Wisconsin; and the second by Robert McNeely on “The Challenge of the New Urbanization to Education.” Both are provocative.

The reviewer found Part Three of the volume to be of special interest. The papers included tend to be somewhat more scientific, emphasizing general principles. They provide a conceptual background for viewing the problem of urban sprawl. The first of these is by Harold Mayer and discusses “The Pull of Land and Space.” He conceives of the problem of urban sprawl as being one of reducing its frictions. To quote Professor Mayer, “Large cities do require space, and thus they spread. Urban sprawl in itself is not undesirable; it is a manifestation of the urban way of life, which can be available to all within the sprawl, along with what some people believe to be the amenities of space.” He summarizes the major concerns of urban sprawl to be (1) a concern with the decrease in land devoted to productive non-urban uses, especially agriculture, (2) a concern with the effects of the spread of cities upon their internal structure, and (3) a concern about the form of the city and the relations of the urbanized areas to the declining amount of open space accessible to them.

Professor Edwin Thomas in a paper entitled “What Sprawl Has Done to Central-place Theory” claims that “to handle urban sprawl we are ultimately going to see a central-place theory that does not deal with aggregates, with entire trade areas, but with the family behavioral unit in an attempt to examine a more basic spatial interaction model that involves two points, rather than a point and an area, which has been the concern of central-place theory to date.”

Peter Nash outlines the pressures brought by urban renewal, and presents a formula for using administrative pressure to effectuate renewal.

Edward Higbee presents an outstanding paper on “Agricultural Land on the Urban Fringe” in which he discusses the activities of two types of synthesized agriculture-and-land development enterprises which, properly coordinated with public policy, should serve as salutary instruments by which the metropolis of the future