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Similarly, Harris' discussion of the cow in India shows that the religious taboo is the outcome of economic function and that the first sight reaction of the cow eating man's livelihood is counter-acted by the universal use of cow dung, beef by the casteless, bullocks for agriculture, and so on. Thus we see that ritual behavior may be strongly effected by the natural ecology of an environment

Aschmann's comments are particularly relevant since he is a geographer reviewing primarily an anthropological book. He points out that an economic geographer could draw comparisons between cattle in a Hindu society and western ranching. Aschmann realizes that the truth of the ecological hypothesis in human society depends upon the rationality of man's culture, whether conscious or unconscious. Likewise he states that the only way to regain areas that modern man is deliberately destroying for short-term gain is to incorporate the ecological ideology.

A major complaint of Aschmann is that the volume is too heavily biased in favor of subsistence or semi-subsistence economies. Perhaps this can be expected in an anthropological text, but it is unfortunate in that Leeds and Vayda are aiming at a larger audience than the proceedings alone would have envisaged.

One of the most useful results of the volume is that it illuminates the continua on which societies may be placed, even though the upper parts of the continua are inadequately described. For example, there is the continuum between hunting to complete domestication to releasing back to the wild; another is the relationship between food requirements, food tolerance, and latitude; a third is the effect of technology on the size of enterprise.

In summary, one feels that Leeds and Vayda have proven their point that man should be studied in terms of his complete environment rather than individually in terms of culture. The book definitely fills an empty niche. However, its most general fault is that of nearly all symposia proceedings: another book with newer methods and material on the same subject is already needed.

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Future environments of North America. Edited by F. FRASER DARLING and John P. MILTON. vx+767 pages, illus., ref., index. Garden City, New York, The Natural History Press, 1966. \$12.50.

« In the past our continent was big and our impact on it was small. America was beautiful. Today our economy and population have grown. The continent seems to be getting smaller, and what is still beautiful may not be beautiful for long. »

These formidable remarks stress the underlying theme of *Future Environments of North America*. The volume is a fresh, uninhibited, and sharply focused permanent record of a four-day conference convened by the Conservation Foundation at Warrenton, Virginia, in 1965. Thirty-four contributed papers and six vigorous discussions are reproduced in full, grouped as they were at the symposium into six sections: I. The Organic World and Its Environment (Deputy Chairman, Ian McTaggart-Cowan); II. Regions: Their Developmental History and Future (Deputy Chairman, Edward H. Graham); III. Economic Patterns and Processes (Deputy Chairman, Joseph L. Fisher); IV. Social and Cultural Purposes (Deputy Chairman, Clarence J. Glacken); V. Regional Planning and Development (Deputy Chairman, Christopher Tunnard); VI. Organization and Implementation (Deputy Chairman, Samuel H. Ordway). Each section begins with an introduction by its deputy chairman, followed by summary remarks from the speakers concerning their own papers. The papers are then presented and each section concludes with a general but frank discussion by all participants. An introduction to the book is presented by F. Fraser Darling, while a penetrating summary of the conference and papers is given by Lewis Mumford. Two gratifying aspects about the book are that it has been published reasonably soon after the symposium, and that approximately one-fourth of the distinguished participants at the conference and, thus, authors of papers, were professional geographers.

The book brings together in one unit the views and opinions of nearly forty ecologists, geographers, regional planners, economists, jurists, and conservationists about the true nature of

the pressures on the land and the people of the North American continent, and illustrates the ways in which these conditions may be alleviated. Its purpose is to insure the existence or the replenishment of a sufficiently *varied* environment to sustain all of life, including human life, and thus to increase man's perspective so that he might increase his conscious development. Therefore, the volume is an attempt to show where man's technology should synchronize with morality, domesticity, and civilization, rather than destroy all three, since no single factor should ever be allowed to dominate the environment.

The introductory section on the « Organic World and its Environment » favors the human environment, since man is the dominant animal species of the environment. Man can either expand his occupancy heedlessly and degrade the landscape, pollute the air, the land, and the water, or, with care, he can preserve the greatest possible variety of organic wealth that is the result of three billion years of evolution. Durward Allen opens the section by describing the habitats and vertebrates that are at present endangered by man's heedless expansion. He indicates that although natural ecosystems are vital for scientific study (since their durability is something man must understand), little has been discovered about them, and thus it would be foolhardy to destroy such systems before the more competent scientists can see them. Stanley Cain produces an essay on concepts and terms, the value of which is to point out that in scientific study man must use scientifically exact terms and stick to them. According to Ian McTaggart Cowan, the concept of conservation was a turning point in human development which marked a stage of mature adulthood. Starker Leopold and J. D. Ovington then present two papers outlining examples of the North American environment. Leopold points out that man will inevitably change natural environments simply by his civilized presence in greater numbers. Ovington reveals that ecological principles are usefully applied to practical problems of land-use and agriculture, and that all organic studies must be seen within the framework of the ecosystem. The section is concluded by Paul Waggoner who demonstrates that by modifying weather men can easily alter habitats. However, he asks ecologists if they have the knowledge to say what results would occur to land and life if he used his technology

The second section brings the concepts and principles of the first down to a concrete footing by examining North America regionally. Ross Mackay, Gilbert White, Firman Bear, and Gerado Budowski examine Tundra and Taiga, Arid Lands, Productive Lands, and Middle America respectively. Mackay stresses the limiting factors that make organic life so delicate in the north and remarks that only local modifications by man could have widespread aggregate effects that are unheard of in mid-latitudes. White shows how man can come to terms with the more hostile arid environments. Where water is a major problem, factor man must turn to residence and recreation rather than attempt grazing or agriculture. Bear tells how human creativity and ingenuity are the keys to land-use, and that by changing custom and diet man could accommodate many more people in the productive temperate lands. Budowski sharply outlines the lot of man in the humid tropics, stating that external aid only creates a false confidence and that solution must come via internal education in such things as basic ecological principles and birth control.

Economics and environment are the concern of the five papers in the following section. Joseph Fisher sees economics as a methodology for ecologists, since ultimately all action must relate to finance. However, much more must be learned about the ecological effects of economic planning, especially in agricultural and hydrological programs. As far as resource economics is concerned, North America will not lack anything quantitatively in the foreseeable future, but qualitatively it will lack such attributes as quietness and undisfigured landscapes. Then Kenneth Boulding shows how similar economics and ecology really are; concerted action along the path of public good results in solutions to problems in both disciplines. Marion Clawson notes the increasing importance of leisure time in human activity, predicting that more people will spend more leisure time outdoors in the near future. Naturally such increased pressure will have a serious effect on the environment. Richard Meier and Ayers Brinser complete this section with papers on the present and future significance of economics and technology on environmental resource developments.

The five papers in the fourth section deal with social and cultural ties to the environment. Raymond Dasman highlights the contrast between environmental changes caused by the in-

digenous peoples of North America and those groups of European extraction. He states that even present American attitudes toward nature vary over the continent in relation to affluence, leisure time, and other factors. Noel Echorn specifically dwells on National Parks in his paper, emphasizing that although parks constitute less than one per cent of the continent's area, each park was established to preserve some natural feature. However, there is now a need for preserving natural units according to some systematic plan. The author further states that parks have merely become displays, thus making them less natural. This discussion is followed by Seymour Forbes' examination of stress and creativity from the medical viewpoint, illustrating how communion with nature is necessary for man's advance in both urban and rural societies. Again there is a plea by William Vogt for man to live by ecological rather than by economic relationships, especially in fragile ecosystems. He clearly indicates the moral evils of advancing technology without the similar advance in education and birth control. Professor Glacken closes this section with enlightening comments on man's debt to posterity. In communicating with nature man sees beauty, variety, and complexity; without these experiences with nature man loses dignity, incentive, and true perspective.

A large group of authors examines regional planning and development in the light of the preceding sections. Several discuss topics in their own particular areas of the environment such as: towns (Dickinson), empty areas (Durden), degraded habitats (Fosberg), coasts (Steers), and the countryside (Hall). McHay argues that general concepts of ecology on a regional basis are of no use in planning, thus precise studies of microareas must be available. Similarly Dansereau suggests that a precise and large-scale ecology of man must be developed before ecosystematic studies can be used in planning and development. Definitions of the region and planning are presented by Coleman Woodbury, while Sanford Farness illustrates the five types of resource planning and explains how these would be implemented better regionally rather than systematically. Lastly, a plea for large units of scenic preserves comes from Christopher Tunnard.

Significant papers in the final section decide how plans for the development of future environments can be organized and implemented. Paul Brandwein makes a telling attack on the present educational system and suggests that all education must be « experience in search of meaning ». Further school must not be limited by the teachers' experiences, but teacher and student must proceed together to new experiences of given concepts. Ann Strong then speaks as a lawyer and shows what an « adequate distribution » of open space could be while Lyton Caldwell describes the difficulties of implementing twentieth century concepts with an eighteenth century Constitution.

Several books and symposia reports have appeared during the last two decades on the subject of man and environment. A particular milestone was reached with the publication of the Wenner-Gren Conference record « Man's Role in Changing the Face of the Earth. » However, with the exception of the latter, few books have looked to the future. Thus, this publication has probably reached another milestone in man's advance in his relationship with the environment. Certainly this volume has its faults. It overstresses the problems of the United States, and does not examine fully those critical situations found in Canada and Mexico. Several of its essays become carried away with the present and do not look clearly to the future in their fields. On the other hand, the book does emphasize the real questions that are current environmental issues in North America. Further, the volume must be considered an essential guide to current thought and to relevant literature on such topics. Above all, the book shows the need for ecologists at all levels of government, and the need for more public action in controlling the environment. The latter may go against traditional American thinking, but by unflinchingly stressing it, *Future Environments of North America* may well become an ecological classic.

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