

THE RESEARCH SCIENCE AND THE SHAPING OF MODERN LIFE REVOLUTION



A VIEWING AND DISCUSSION
PROGRAM IN
AMERICA'S LIBRARIES

Written by: Sharon Kingsland
Professor of the History of Science, Medicine, and Technology
Johns Hopkins University

Session 6 Biodiversity Biodiversity

In a book published in 1864 called "Man and Nature or, Physical Geography as Modified by Human Action," George Perkins Marsh wrote passionately about the devastating impact that humans were having on the landscape. Taking a broad historical view, Marsh described the changes in the landscapes of Europe, the Middle East and Africa since antiquity, and of North America in the nineteenth century. He warned that just because we don't know exactly how human actions affect the world, we should neither ignore nor underestimate these effects. He suggested that human ingenuity, so evident in the impressive engineering feats of the modern age, might be turned to rebuilding and rescuing wasted lands.

Marsh's book inspired the development of the conservation movement in the United States and with it, a better understanding of the complex relationships between animals and plants and appreciation of the benefits that ecosystems provide; maintaining the quality of our air and water, stabilizing landscapes and preserving soils, modifying climate. Destroying habitats and species sets in motion ecological consequences that directly affect our quality of life. Among the insights that have emerged is the idea that certain species have key roles in the creation of habitats in which other species live. The loss of such "keystone species" may result in the collapse of the community because so many other species depend on them.

Since the 1970s ecologists have recognized that humans are causing species extinctions at an unprecedented rate. The current wave of extinction has been called the "Sixth Extinction," comparable to the five previous catastrophic extinctions that have occurred in history, the last one including the extinction of the dinosaurs. One important difference is that in past extinctions, animal species were affected far more than plants. In the current extinction, caused by human activity, plant species are also being lost. Since plants capture energy from the sun, loss of plant life means less energy is available to support other organisms throughout the ecosystem.

The term "biodiversity" encapsulates three ways of thinking about biological diversity: diversity of ecosystems, diversity of species, and genetic diversity. Preserving biodiversity includes maintaining varied landscapes within ecosystems, protecting endangered species, and preserving genetically diverse ancestors of our domestic crops. In a 1986 National Forum on Biodiversity, scientists drew attention to the root cause of the problem - human overpopulation. Overpopulation is not simply a problem of overcrowding but also of consumption of energy and resources. Developed countries are overpopulated when you take into account their enormous consumption of energy.

Protecting biodiversity has become one of the central goals of conservation. In the United States, conservation of wilderness areas has been important since the late-nineteenth century. But in establishing the first national parks, emphasis was placed on picturesque landscapes and unusual geological features. Today far more attention is given to preservation of biodiversity. In conservation biology, an interdisciplinary field that emerged in the 1980s, preserving biodiversity is seen as an important means of maintaining the stability of ecosystems. Continent-wide networks of reserves have to be created, with buffer zones and corridors, to provide the best protection of diversity.

Scientists point out that biodiversity is useful in a material sense, and that we lose by eliminating vast genetic stores before we know what treasures they hold. Alongside this argument, another concern is the spiritual significance of nature to humans, summed up in the "biophilia hypothesis." The term, coined by Edward O. Wilson of Harvard University, expresses the idea that humans have an innate love of nature and of certain types of landscapes, a deep feeling that is the product not just of our culture but also of our evolutionary history. To deny this spiritual attachment to nature is to deny something basic to the human psyche. We gain fulfillment as humans through our relationship with the natural world. The preservation of biodiversity is an issue that is not restricted to scientific questions, but is a broad humanistic concern that raises philosophical and religious themes.

Further Reading:

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- Takacs, David. *The Idea of Biodiversity: Philosophies of Paradise*. (Baltimore and London, Johns Hopkins University, 1996).
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