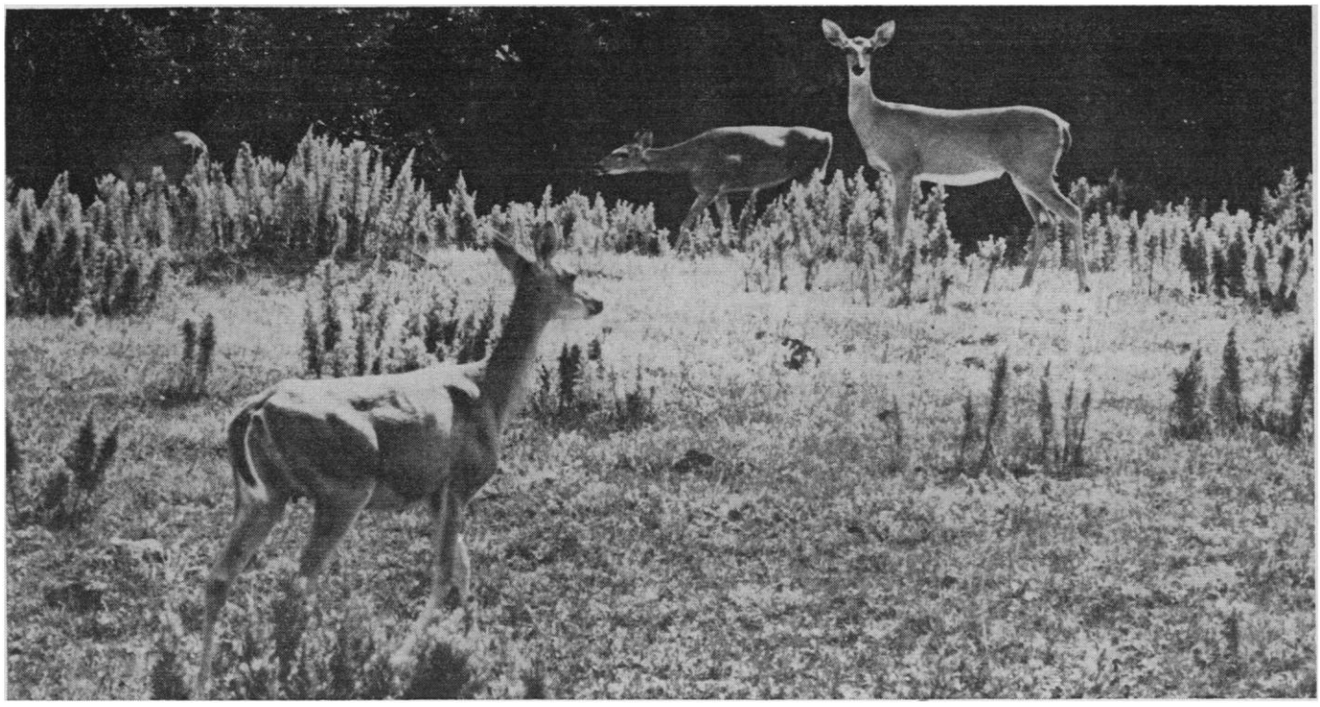


U.S. Department of the Interior

International Biological Program

AAAS Symposium • 28–29 December 1970 • Chicago

The International Biological Program (IBP) is a 5-year, 60-nation study of the biological basis of productivity and human welfare. Now in its third year, the IBP encompasses basic and applied research on numerous aspects of man's relationship to his environment throughout the world. Generally, the lesser developed nations have concentrated on research problems such as increasing productivity, insect pest control, conservation, and other factors. In more scientifically sophisticated nations, the research is oriented more toward pollution and environmental management, with studies of man's adaptability being a large part of the environmental picture.

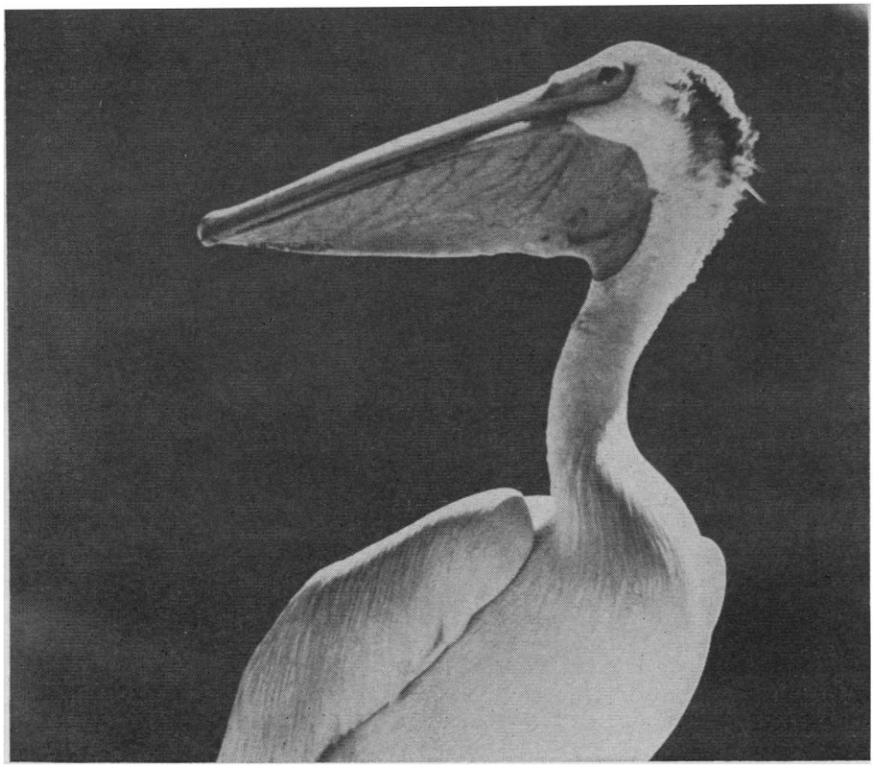
The U.S. National Committee for the IBP realized 3 years ago that traditional methods of biological research were not going to be sufficient to provide the knowledge needed to cope with the scope and complexity of the environmental problems facing our nation. As a result, a new category of research was devised—a set of multidisciplinary, large-scale efforts called "integrated research programs." Sixteen of these now make up the major effort of the U.S. IBP. Ten are directly related to basic research on problems of the environment, and six are devoted to the study of man's adaptability to it.

A typical IBP integrated research program on the environmental side involves experimental manipulation of large biological systems, such as ecosystems; the study of interactions in such systems; and the synthesis of large amounts of information using computer techniques into working models that can be used for predictive purposes. Disciplines such as hydrology, meterology, chemistry, mathematics, soil science, economics, and even some of the social sciences are involved, in addition to ecology. On the human adaptability side, the scale of research is somewhat smaller by necessity, but in studies of such peoples as Eskimos, South American Indians, migrants, and populations living at high altitude, many factors are being taken into consideration. These include not only the health of these populations but also social conditions, nutritional patterns, biological rhythms, and relations with other neighboring races.

The purpose of this three-session symposium is to describe the progress of the U.S. IBP to the present time. In the first session, the concept of what is an integrated research program will be discussed along with its impact on research and teaching. Use of systems analysis—a major factor in the important environmental studies—will also be detailed, with an example of ecosystems research patterned along these lines.

The human adaptability session will explore the concept that multidisciplinary studies of technologically primitive populations can provide new perspectives on the nature and limits of man's biological adaptive capacity. Basic philosophy and methodology with results from the studies of Eskimos and tropical forest Indian tribes will be described. A paper on nutrition will illustrate how broad multidisciplinary studies provide new insight within a given discipline.

Aspects of IBP programs in other nations will be presented in the third session of the symposium. A number of these are being done in cooperation with the United States effort with foreign scientists participating as equal



partners in the planning and performance of such research.

The results of a few of these internationally collaborative projects will be presented by pairs of speakers, one from the United States and one from a foreign laboratory. The projects to be discussed have been produced on a cooperative basis and the reports will emphasize the overlapping nature of the research and the ways in which the IBP has benefited the general research area. One of the two projects to be discussed is pursued jointly by the United States and Latin American scientists who are studying the general area of convergent evolution. The other, in the area of marine productivity, has involved primarily scientists from the United States, the Mediterranean area, and Peru.

Speakers: Four speakers will speak at each session, with the first and third sessions having a 15-minute introductory presentation. There will be about 15 minutes for questions after each paper.

JOHN MCKEE
National Research Council, Washington, D.C. 20418

Speakers and Topics

(28 December, morning)

Integrated Ecological Research

Chairmen: Stanley I. Auerbach (Oak Ridge National Laboratory) and Charles Cooper (National Science Foundation).

Stanley I. Auerbach, *Scope and Nature of Integrated Research Programs.*

George Van Dyne (Colorado State University), *Organization and Management of an Integrated Research Program: Its Impact on Research, Teaching, and Manpower Requirements.*

Douglas Chapman (University of Washington), *The Systems Approach to Ecological Research: A Contribution of the International Biological Program.*

David E. Reichle (Oak Ridge National Laboratory), *Interpretation of Data and Ecosystem Synthesis: Energy and Nutrient Flux in Terrestrial Invertebrates.*

(28 December, afternoon)

Human Adaptation to Extreme Environments

Chairmen: O. Lee Kline (American Institute of Nutrition) and Paul T. Baker (Pennsylvania State University).

William Laughlin (University of Connecticut), *Development of Human Adaptation Studies.*

David Hughes (University of Toronto), *Adaptation to the Arctic Climate.*

James Neel (or associate) (University of Michigan), *Adaptation to the Tropical Climate.*

C. Glen King (Columbia University), *Impact of the Environment on Nutrition.*

(29 December, morning)

Multinational Collaboration

Chairmen: Richard C. Dugdale (University of Washington) and W. Frank Blair (University of Texas).

Convergent Evolution

Jorge Morello (Instituto Nacional de Technologia Agropecuaria, Chaco, Argentina), *Vegetational Structure of the Thorn Scrub.*

Richard Sage (University of Texas), *Convergent Evolution of Lizards in the Thorn Scrub.*

Marine Productivity

Ramon Margalef (Instituto Investigaciones Pesqueras, Barcelona, Spain), *The Effect of the Chemical Environment on the Population Structure of Phytoplankton.*

Theodore Packard (University of Washington), *Enzymatic Clues to the Physiological Structure of Phytoplankton in the Sea.*

The Preliminary Program appears in the 25 September issue of Science. *Reports of symposia appear in the following issues: 28 August, "Human Behavior and Its Control"; 4 September, "Land-Use Problems in Illinois"; 11 September, "Aleutian Ecosystem"; 18 September, "Reducing the Environmental Impact of Population Growth"; 2 October, "Critical Issues in Research Related to Disadvantaged Children"; 9 October, "Women in Science"; and 16 October, "Advances in Human Genetics and Their Impact on Society" and "Genetic Diseases and the Quality of Life."*