

Atmospheric Dispersal of Biologically Significant Material

A program requiring extensive U.S. effort and involving international participation in Europe, Australia, Japan and elsewhere to advance knowledge on the atmospheric dispersal of spores, pollen, microbes, insects and particles and gases that biologically affect organisms. This program has been endorsed internationally and nationally. It is justified since large segments of the population are pathogenically sensitive to pollen, fungus spores, algae and other airborne particles; since plant pathogens atmospherically dispersed annually cause crop losses in the U.S. worth several billions of dollars; since insects, scattered widely by wind currents, serve as vectors of viruses and other pathogens that contribute to human misery and loss of life; and since gene flow does occur by this means and new subspecies of pests and hybrid plants are thus brought about. Scientists of many disciplines nationally and internationally are interested in this program and have contributed to its present coordinated development. Benefits of new knowledge to be acquired will impinge on all pollution programs and will provide better bases for studies by plant and animal pathologists toward understanding aerial spread of diseases. Broadly the program is estimated at \$2 million for the first year and will increase at approximately 25% per year leveling off at approximately \$5 to \$6 million per year as new investigators are trained in the scientific disciplines that will be involved. A description of this program is attached for the record.

Investigation of Endemic and Invading Biotas of the Hawaiian Archipelago

This program has kindled the constructive thought of scientists world wide. The Hawaiian group of islands, from a biological point of view, has been geographically separated from other world influences for centuries. That biological isolation in the last 100 years has been dynamically and massively penetrated. In a few more years the opportunities for study of the accelerating changes now occurring will diminish and many opportunities will be permanently lost. In March of this year a group of biologists associated with the IBP met with scientist of both the Bernice P. Bishop Museum and the University of Hawaii to assess the value of a program in this area, to select the plant and animal groups most urgently in need of study, and to interest the State and military officials in the urgency of undertaking this research now. The report of this meeting has been given to the Special Committee for the IBP of the International Council of Scientific Unions and has been strongly endorsed by that group. This report is also attached for the record. The estimate for this program is \$2 million over a five-year period.

Drainage Basins and Landscapes

This program seeks as its objective better understanding of the interactions in complete ecosystems so that evaluations may be made of man's dual role as a manipulator of, and a functional component in these systems.

Man is using his dominance of the earth to produce the most far reaching, sudden and drastic upset of natural conditions the world has ever seen. During his time on earth, man has changed nearly all the world's biotic communities in one way or another. He has altered beyond recognition much of the land surface in temperate regions and in the drier part of the tropics. His modification of his environment is continuing at an accelerating rate.

Man has shown that he can guide the evolution of communities of organisms in ways which satisfy his esthetic sense and at the same time provide him with a stable source of natural resources, or alternatively he can destroy that which is irreplaceable.

Reconstruction of biological resources, the development on a world-wide scale of biotic communities which will have a maximum stability and usefulness to mankind is a task that has been barely begun. It will require for its successful completion all the knowledge of living organisms we can acquire.

The role of biologists is clear. We must supply the basic information needed by the architects and planners of these new and more productive, man-directed communities of organisms. Ecologists, conservationists, foresters, agriculturists, and other specialists will require a great quantity of facts, now unknown, both about the individual species that can form these communities and their actual or potential relationships to each other.

The task is to explore the diversity of life. We must learn about the population structure of individual species, the ways in which species interact with each other in communities, and how both species and communities evolve. Such knowledge is essential to make the world a better home for mankind.