

APPENDIX D

A CONTRIBUTION TOWARD A WORLD PROGRAM IN TROPICAL BIOLOGY

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By comparison with North Temperate Zones, knowledge of biology in the tropics is in an incipient stage, yet this region seems to hold greater promise for the emergence of new biological principles and concepts than any other. With this thought in mind, 60 scientists from the United States and Latin America met for a Conference on Tropical Biology,* in Panama 10-12 November 1966, and urged the Smithsonian Institution to use its unique attributes to lead in the development of a world program in tropical biology. Such a program is relevant to the International Biological Program theme of broadening the productivity base for human populations. In 1965 approximately 1.1 billion people ($\frac{1}{3}$ of the world population) made their homes in about 70 sovereign nations in the world's tropics. Despite the natural richness in variety of species and the high rate of conversion of solar energy to plant and animal life, tropical ecosystems (living communities, including man, and their total environments considered as functional wholes) are readily destroyed through overexploitation by man. Degradation of most tropical ecosystems is now a world concern, since all nations are ultimately affected. Soil erosion on overgrazed savannas in Kenya and bedrock washing of steep mountain slopes denuded of tropical forests in Ecuador illustrate the deterioration of environments under the pressure of expanding human populations.

The most urgent world problem today is the establishment of harmonious relationships between human societies and the environmental resources upon which they depend. Most tropical ecosystems are energy-rich compared to ecosystems elsewhere in the world; therefore, preservation of the productivity of tropical environments is a matter of world concern. In view of the rapidly increasing demands on tropical environments, a world program in tropical biology is urgently needed to provide the scientific foundation for the management of tropical resources. It would be a mistake, for example, to apply our technological power to the building of a sea-level canal in tropical Central America without also attempting to increase our scientific understanding of the effects of the new canal on nature, including the world's human societies. Such a foundation in science depends on new knowledge gained through research in the tropics. The application of principles derived from temperate-zone ecosystems has already contributed to the deterioration in the productivity of the tropics. Management of tropical environments must be approached through studies of the components, structure, energy conversion, cycling of nutrients, and the process underlying temporal changes in ecosystems altered by man within the tropics, rather than through the application of temperate-zone concepts. The foundation of knowledge required for sound decisions on limiting human populations and technological modifications of environments in the tropics, as elsewhere in the world, must emerge from an integration of ideas from both the natural and behavioral sciences.

The Smithsonian Institution is in a key position to encourage the coordination of the interests and efforts of universities, private foundations, corporations, national scientific laboratories, and governmental agencies, both within the United States and abroad, in developing an effective cooperative program of research and education in the biology of the world's tropics. Such an interinstitutional, multidisciplinary effort is basic to a world program aimed at achieving rational use of

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