

so. This is particularly true for living creatures, because they are so easily affected by human activities, and because of the very tenuous, precarious nature of the web of life that exists on the surface of our planet.

In the IGY we were dealing with the whole mass of the earth, several billion trillion tons of matter. In the case of the International Biological Program we are dealing with a thin web of living creatures on the surface of the earth, the total weight of which is probably less than a hundred billion tons, about the same as the weight of buildings on Manhattan Island. One of our other concerns is that human beings have altered part of their own biology by lowering their death rates. This is a radical alteration, and it requires, most biologists believe, two actions: One, a further modification of human biology by lowering birth rates; and two, a very great increase in the production of food and other biological materials to take care of the greatly increased population that we are bound to have before the lowering of birth rates can take effect.

We are also concerned with the problem of the quality of the environment, how men and women and children can live in the natural world—not to conquer the natural world but to live in harmony with it; how can people be happiest in nature?

So our practical objectives are: to conserve and expand the world's biological resources to serve human needs; to maintain and improve the quality of the natural environment as a realm of human happiness; to improve human nutrition as a basis for human health; and to gain greater understanding of the questions of balancing human fertility and natural resources.

The kinds of science we are going to be especially concerned with are the genetics and dynamics of populations, the factors that control biological productivity, the ways in which plants, animals, and especially men, adapt to their environment, and the changing distribution of living things in the sea and the air and on the land. This in general is a particular kind of biological science, ecology; that is the relationship of organisms to each other and to their environment. And as I said, we want to emphasize those projects and programs which can benefit from international cooperation and a free exchange of scientists, research results, and students among different countries.

We are also interested in using some of the new technologies that have been developed such as, for example, the use of satellites as a means of surveying the earth and mapping the distribution of different kinds of plants, different kinds of plant diseases, and so forth.

Mr. ROUSH. May I ask a question, Mr. Chairman?

Mr. DADDARIO. Yes, of course, Mr. Roush.

Mr. ROUSH. Doesn't the use of satellites almost necessarily have to be preceded by the use of just ordinary aircraft? I believe they are using sensory devices to survey the plant life of various areas of the country. I know that my own State university, Purdue University, is involved in a contract with McDonnell Aircraft Co. to do just this thing.

Dr. REVELLE. Certainly, in the development of the technology, this is quite correct. The technique for using this multispectrum sensing has to be developed by a combination of ground observations and carefully controlled air observations.