The work of the International Biological Program that I mentioned earlier is fundamental, necessary, and long overdue. But all of the knowledge that can be accumulated by this kind of ecology is of little moment unless we strive equally hard to learn how to put it to work.

I will leave you with one illustration. During this century, and especially during the last two decades, there have been many efforts at land reform. The idea was simple. Divide the land up among those who would work it. Where there are large holdings by private individuals or institutions that are not fully worked, divide them up and pass them out to farmers. This idea had a converse. Because primogeniture was not practiced in many countries, as generations passed and populations grew, inheritances resulted in minute, often scattered, inefficient land holdings. By one means or another, especially exchange, consolidated and efficient farms were to result.

Land reform with few exceptions has been a failure. In some countries, because of the population and the land-man ratio, there simply isn't enough agricultural land to alleviate the land hunger. One result of this was too small, uneconomic farms.

It is slowly being learned that effective land reform is revolutionary. Ways must be found to increase efficiency and agricultural productivity. Ways must be found to increase the capitalization of the farmer so that he can afford fertilizer, for example. He must have credit. He must have a market. He must make a reasonable profit. He must have security. He must have knowledge.

This sort of thing doesn't flow automatically from dividing up the land. It doesn't flow from a political upset or a revolution. It doesn't follow as an inevitable consequence of building a dam for power or irrigation. It certainly doesn't flow from gifts or soft loans of money by one country to another.

The changing of traditional ways of doing things is slow. The adoption and adaptation of technology are slow. Education is slow. The change of cultures is evolutionary, not revolutionary. We speak of the Agricultural Revolution, but we are speaking of six centuries and the acceleration of the past hundred years, and that only for a very small part of the world. We think of the Industrial Revolution, and some persons would date it from the close of the 18th century, or perhaps longer from the start of science-based technology, and that, too, has not yet affected much of the world's population despite transistor radios in hungry villages.

Having been negligent about the population/food equation that Malthus sensed nearly two centuries ago, we cannot now expect a quick solution. Having allowed our environment to deteriorate for decades, we cannot expect to repair it overnight. There are difficult times ahead. We have only one recourse that I see: To double and redouble every effort; to make up our minds to afford the cost, as Evelyn Hutchinson said, of repairing the biosphere.

Brock Chisholm once said, "If now we all revert to our little private concerns, if we all tell ourselves 'it is someone else's responsibility,' there will one day be none of us left, not even any to bury the dead."

An important ingredient, an indispensable and even optimistic one in my opinion, is that we stop looking at the world as though it were some sort of haphazard conglomeration of independent things. We live in a pluralistic world and we ignore it at great risk. We have found, if we examine our situation, that there are systems of interacting phenomena that characterize the world. We must work with the systems. This is the usefulness of ecology. Although not all persons can or should be ecologists, we should all endeavor to use ecological thinking. That is, we should think in terms of interrelations. Famine is not a side effect of public health programs and inadequate attention to food production. It is *the* effect. That some people are alive to face an existence of misery is the side effect. When enough of us can think in this radical way, then there is hope for the future.