food out of the 9 percent that is presenly being used. For it is a fact that the average crop yield in underdeveloped countries is about 25 percent of that found in highly developed agricultural countries such as the United States or Western Europe. Yields are excessively low in India, large parts of Africa, sections of Latin America, and so forth.

Now then, what has all this to do with out space program? We have all seen the pictures taken with a Hasselblad camera from the Gemini spacecraft. The Hasselblad is a simple hand-held camera, not very sophisticated, but its pictures showed a tremendous amount of detail. Now, if we can combine more sophisticated cameras, with better resolution, with some new types of film material that have recently been developed, we shall be able to use the space medium to conduct continuous, never-ending surveys of our Earth resources. We shall be able to tell rye from barley, and rice from soybeans. We shall even be able to tell how those soybeans or that rice is coming along. And this includes seasonal variations. We shall be able to mark the progress of these crops through their growing seasons, and the impact of weather—droughts, storms, hurricane damage—on that progress. And at harvest time, we can predict the harvest yield in various parts of the world. Now this business of being able to identify "what" and "where" and "how much" is going to be harvested in various locations of the Earth is half of the problem of Earth resources management; namely, the supply of food available.

The other half is the demand, and this is measured in numbers of people. The very same system that enables us to distinguish between types and qualities of crops can also give us the pattern of population growth. If we continuously overfly the same areas we can learn by city and town where man is multiplying most rapidly. We can know how many eaters there are and where they live.

These supply-and-demand data gleaned from Earth-orbiting spacecraft would give us the information needed for resource management.

We would feed this information into a computer, and the computer would tell us many weeks ahead of time of famine in Calcutta or somewhere unless we do something soon. Food shipments could be initiated before disaster hits. This is one benefit.

But there are other benefits. Suppose we learn that the yield in certain parts of the world are consistently poor. As part of our worldwide system we could employ multispectral sensors to find out what the problem is—too much salinity in the soil, poor fertilization, not enough water, maybe soil erosion. We could convert this information not only into food shipments, but into words of advice to solve a chronic agricultural problem. Instead of food, we could ship fertilizer, or even consultants to give some advice on the spot. And then, if we bring our communication satellites into play, to educate people directly on steps they can take to help themselves, we have another powerful tool in space for solving the problem.

The system I have been describing could do more than just look at crops and people.

In addition to application for food management, these same sensors could also be used for prospecting for ore and oil deposits and for updating maps. It has been estimated that it costs about $1 billion a year to update all the maps in the world. And no systems are simpler