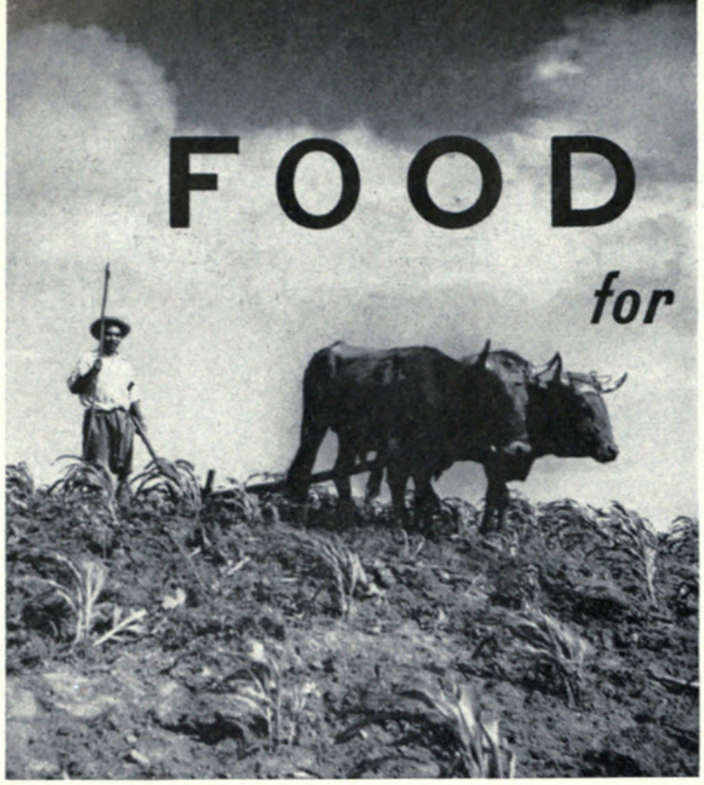

Ox or man power are still commonly used to till the fields in the mountains of Central America. Sloping fields are difficult or impossible to work with tractors. In addition, tractors and other imported farm equipment are often so relatively expensive that they cannot be used. (Photographs by the author.)

Central America

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Politically, Central America includes five republics: Guatemala, El Salvador, Honduras, Nicaragua, and Costa Rica. These countries are just about as diverse as the greater region, stretching from the Isthmus of Tehuantepec in Mexico to the Isthmus of Panama, that comprises biological Central America. Within the latter bounds flourish nearly all the types of vegetation to be found in the tropics of our hemisphere, except that characteristic of the high snow mountains.

The problem of producing sufficient food to support the population of any biological area involves the following principal considerations:

1. Man and his relation to the area: where he can live and progress; his increase in numbers.
2. The characteristic agriculture, soils, and climate.
3. The plants available as food, and what can be done with them.

My remarks will apply these considerations to the problem of food for Central America.

There are fairly good reasons to believe that man reached Central America perhaps as long as 10,000 years ago. How long man has been a farmer in this region is not at all certain, but it is my guess that rational agriculture or horticulture dates back not more than 4,000 years.

Man came into the area from Mexico, undoubtedly migrating down the mountain chain that extends, with only one minor break, through the region from northwest to southeast. He lived in the mountains because these were more acceptable than the lowlands as places to live, just as they are today. The mountainous area was the area of greatest opportunity.

When the population could no longer maintain itself in the highlands by simple seed-gathering and hunting, then agriculture must have had its beginnings. Sometime during this period the common field bean was domesticated and selections made from it. Native scarlet runner beans were even more easily taken over; their primitive types were surely much like those found in many parts of the highland region today. Other plants were brought into cultivation.

Also during this period maize came into the picture, either as a local cultigen or an import from elsewhere. Thus there were in the highland region two good protein food plants and one excellent source of carbohydrates. The diet was balanced and the stage set for one of the earliest population explosions in America. These foods at the same time provided the base for an incipient civilization, which was to become one of the most advanced in the world in its day.

It was not long before man began to push off the highlands to middle elevations. There the real explosion in his numbers took place, as well as advances in culture and civilization. Cultural centers were established: notable ones at Copán and Quirigua. In time, the agriculture that supported them began to spread farther and farther away—so far, indeed, that farmers could probably come to a center but once or twice a year.

It is my feeling that grass defeated this civilization of the Maya and related groups: that it was the principal cause of the downfall and abandonment of their cultural centers, and the causative agent that reduced the population to a fraction of its former numbers.

Forested lands may be cleared by fire, and, once cleared, three to five crops can be produced one after another before the soil becomes so poor that it is no longer productive. A greater disaster than loss of fertility, however, is the invasion of cleared lands by perennial grasses. Grass is not difficult to control if man has implements of iron with which to work, but it is catastrophic to the farmer who has no efficient cutting or digging tools.

Grass helped to drive the ancient Maya off the highlands; then again from the middle elevations of Guatemala and Honduras to the Yucatan peninsula, where a second renaissance took place. Still later, grass again figuratively drove the Maya into the sea. Because of this agricultural failure, the Central American aboriginal civilization was degraded to such an extent that it could offer little resistance to the Spaniards, and the conquest was carried out by a handful of men during the course of only a few years.

The injection of a new race of men into Central America did not have an immediate effect on food and agriculture. Eventually, however, the iron tools which the Spaniards brought helped to bring about a change that, while not entirely advantageous, did make tillage possible in spite of the invading grasses. The greater and easier production of food was no doubt a contributing factor to the greatly increased population growth following the conquest.

Now Central America is at the crossroad again. Nowhere in the area is there more food than is needed, and in some regions there is an undersupply that may amount to 40 per cent of optimum needs. At the same time, the population may be expected to increase by some 3 per cent each year. Insufficient food is, and will continue to be, at the roots of most social and political unrest in Central America.

It has been said that the characteristic subsistence type of agriculture in Central America is the same as it was 400 years ago. This is true only in part, for new tools and new ideas are beginning to penetrate even the farthest interior valley. Most of the food plants that were grown 400 years ago are the same as those grown today, with an important difference. The plant breeder and the agronomist have gone a long way toward producing higher yielding, more nutritious, and more resistant subsistence crops. Methods in agriculture are changing, though slowly.

On the other hand, many or most of the small subsistence farmers of Central America do not own the land they work. Their interest is to secure the greatest possible crop *this year;* they care little about what happens to the land in the process. Conservation, *this year*, fills no stomachs, allays no hunger pains. Thus, soils in great part are poorer today than they were a century ago. Moreover, due to erosion as well as lack of conservation, there is perhaps less arable land than a century ago.

Climate usually is said to be beyond the control of man, but climate in Central America has been adversely affected by man. Changes in the vegetative cover have altered rainfall and temperature patterns. The effects on runoff are all too obvious. A reversal of the trend, by adopting the measures necessary to control climate through improvement of the vegetative cover, will be difficult and immensely unpopular politically.

The kinds of plants available to pre-Columbian agriculture, and those available and used now, are not very different. With perhaps two prominent exceptions, the basic plant foods of most Central Americans are indigenous: maize, beans, manihot, potatoes, sweet potatoes, peppers, tomatoes, and several kinds of fruits. These make up the bulk of the food intake. Rice from the Old World is an important exception. It is the only one of the Old World food grains that grows and produces well in tropical Central America. Sugar cane of Old World origin, and the sugar from it, are also used all over the area. This is both a subsistence and a plantation crop.

Increased food production can be, and in fact is being, attained in Central America. Better agronomy, fertilizers and green manures, seed selection, plant breeding, increasing the kinds of food plants used, selection for more nutritious varieties, basic education, and agricultural education all are helping to improve the situation. The question remains, however, whether increases in food production due to better technology can offset parallel increases in the number of mouths that must be fed. ■

This field has been "cleared" recently. The men are planting it to beans. After planting 4 or 5 consecutive crops within the period of a year, the field may be abandoned for 5 to 15 years.

Indian corn and scarlet runner beans are commonly intercropped in the Central American highlands. Both plants are as American as blueberry pie.