

# Food, Famine and the Rome Conference

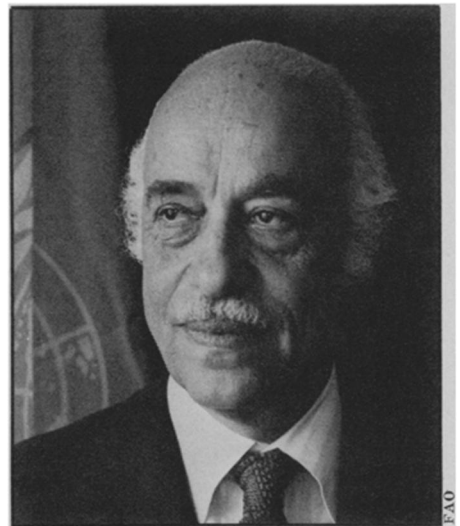
*Science News Science and Society Editor John H. Douglas is in Rome covering the World Food Conference. These are the first of several reports.*

Even before it began, the World Food Conference in Rome threatened to split over politically sensitive issues, while generally accepted strategies—such as the need for more agricultural research and development—were swept along on waves of lip service. With the United States attempting a “low profile” posture, calling on other nations to share the burden of feeding the world’s hungry people, the conference particularly lacked a sense of the leadership that successfully faced the threat of famine following World War II.

The scope of the challenge facing delegates, representing most of the world’s governments, was brought into focus by a report submitted to the conference by an informal group of experts who met just before the first plenary session. Calling itself the “Rome

Forum,” and including such figures as Nobel laureate Norman E. Borlaug, anthropologist Margaret Mead, and former Secretary of Agriculture Orville L. Freeman, the group concluded that only unprecedented, unified effort by developed nations could avert catastrophe. The forum, led by British economist Lady Barbara Ward Jackson, called for establishment of a powerful Food Security Council to coordinate emergency aid, and it supported the position adopted by the conference secretariat that long-term investment in world agriculture must be increased from the present level of \$8 billion to \$10 billion per year to something like \$16 billion to \$18 billion per year.

In answer to a question concerning the statement of National Academy of Sciences President Philip Handler that feeding rapidly expanding populations might prove “counterproductive” (SN: 11/2/74, p. 278), Lady Jackson characterized such arguments as “revolting.” Developed nations must quit acting like



Conference Secy. Gen. Sayed A. Marei.

“Victorian duchesses” toward smaller countries and remember that they themselves are the greatest wasters of food, she said. Lester Brown of the Overseas Development Council added that population growth is already slowing in a dozen or so developing countries, and that even more rapid change is on the way.

Secretary of Agriculture Earl Butz did not respond directly to the Rome Forum’s challenges, but he did admit the situation has become “critical.” He outlined the American position at the conference in four major points: a

## Kissinger Proposes Major Food Research

In his address this week before the World Food Conference in Rome, Secretary of State Henry Kissinger swept aside the inertia that had enveloped the conference’s opening to present specific major proposals to increase food and agricultural research and provide badly needed foreign exchange to underdeveloped countries. He said President Ford told him to declare, “We regard our good fortune and strength in the field of food as a global trust,” and he showed none of Secretary Earl Butz’s hesitation in calling for food reserves some 60 million tons over current levels.

Regarding scientific research, Kissinger proposed that funding be doubled for the existing eight international food research centers by 1980. During that time, he said, the United States will triple its own contribution for the centers, for agriculture research in developing countries, and for research by American universities on the agricultural problems of developing countries.

Within the United States, he said, advanced research will be increased for a wide range of projects, including efforts to increase protein content of common cereals; to fortify staple foods with inexpensive additives, such as vitamins; to improve plant fixation of atmospheric nitrogen, and to develop new machine tools for the world’s small farmers. Next year, he said, various government departments will test advanced satellite techniques for surveying and forecasting important crops, first in North America and then in other areas of the world.

Finally, Kissinger said President Ford is requesting the National Academy of Sciences to cooperate with other government agencies to design a Food and Nutrition Research Program, to “mobilize America’s talent” in seeking solution to long-term food problems.

In the area of food and health, Kissinger pledged \$5 million to initiate an internationally coordinated program in applied nutritional research, and invited the participation of WHO, FAO, and UNICEF. He also proposed a Global Nutrition Surveillance System, to be administered by the same U.N. organizations. Such a group would pay particular attention to the special needs of mothers and young children.

Kissinger said that certain nutritional diseases could be eradicated just as smallpox and other diseases have been and he proposed an immediate campaign against two of the most prevalent of these diseases: vitamin A blindness and iron-deficiency anemia. The United States is prepared to contribute \$10 million to this effort, he said.

He left open the question of how global reserves should be administered, but proposed three planning groups to be set up to work out the details of this problem and those of trade and investment.

“Now our consciousness is global,” he declared, and called for the elimination of hunger within a decade. Whether the American delegation to the food conference, under Secretary Butz, carries forward with this bold thrust remains to be seen.

willingness to provide technological assistance to developing countries, a recognition of the need for a "prudent" system of food reserves, hopes for better cooperation from the Soviet Union in providing crop estimates, and unspecified measures to help the immediate situation.

But neither the government representatives nor the swarm of special interest groups surrounding the conference showed any sign of yet coming to grips with the practical problems that must be faced before resolution of the present crisis can be achieved. The

Rome Forum avoided making any recommendation on population control, lest the issue "polarize" the conference. Butz insisted that agricultural production could only be increased by having "reasonable" prices for crops, but failed to say how those who could then not buy food would be fed or why so many American farmers can't seem to make ends meet. And no one at all wanted to talk about how to divert some of the money now flowing toward the Middle East into channels for producing more food in developing countries of the world. □

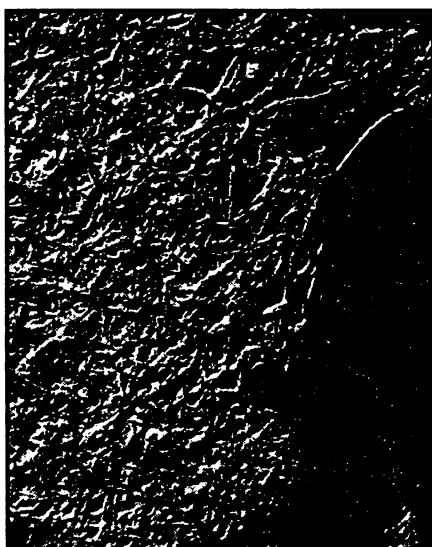
## Plant cell wall material synthesized

The most abundant organic compound on earth—cellulose—literally supports most of the living things on earth, which happen to be plants. Cellulose is a major constituent of plant cell walls, the unique component missing in animal cells that allows plants to grow stiffly upright, away from the earth and toward the sun. All plants, from lacy ferns to towering redwoods, have this common unit of support. The fungi, including mushrooms and yeasts, are considered plants, and have cell walls, too, but in most species the walls are made of chitin, not cellulose.

Being abundant does not automatically make a substance abundantly understood, however, and plant physiologists still are unclear about how a plant manufactures its all-important cell walls. They now have come a big step closer though, with achievement of the first artificial synthesis of cell wall material.

University of California at Riverside plant physiologists Jose Ruiz-Herrera and Salomon Bartnicki-Garcia report the synthesis in the Oct. 25 *SCIENCE*. They were able to synthesize chitin microfibrils like those found in fungi cells. These microfibrils are tiny strands which enmesh in the living plant to form the cell wall. The team homogenized yeast cells and extracted an active fraction that contained a soluble chitin-forming enzyme. They combined this enzyme with the sugar building blocks of chitin, and microfibrils formed.

The artificial synthesis tells plant physiologists several new things about cell wall formation. Most important, says Bartnicki-Garcia, the findings demonstrate that chitin microfibrils can be formed in the absence of membranes. Many scientists had believed until now that chitin and cellulose microfibrils were formed in tiny membrane sacs in the cell's interior. These sacs, they believed, traveled to the cell wall and there deposited the newly formed strands which enmeshed with the existing cell wall structure. Because the team was able to synthesize micro-



Plant cell wall fibers ( $\times 64,000$ ).

fibrils in a disrupted, cell-free fraction containing the chitin-forming enzyme and the sugar substrate, it is clear the enzymes need not be membrane-bound, Bartnicki-Garcia says.

A second important insight, he says, is the confirmation that the Leloir pathway is involved in microfibril formation. The Argentine Nobel laureate chemist Luis F. Leloir several years ago proposed a pathway for polysaccharide (long-chain sugar) synthesis, that included the transfer of a sugar unit from a nucleotide-sugar complex to the growing sugar chain. Many did not believe this to be a pathway involved in microfibril formation, Bartnicki-Garcia says. But, by successfully using as a substrate the nucleotide-sugar complex Leloir predicted, the team proved "unequivocally" that the Leloir pathway is involved in microfibril synthesis.

The next steps, Bartnicki-Garcia says, will be to learn more about the structure and function of the soluble chitin-forming enzyme (which is as yet unnamed) and to try to synthesize cellulose microfibrils using similar laboratory techniques. □

## A safer road to engineering genes?

One of the goals of modern research is to eliminate the causes of disease at the genetic level. Researchers still are far from this goal, however, and already have hit some snags. The manipulation of genes in mammalian and bacterial cells may hold great dangers as well as great promise for medicine. The techniques now used could, some think, result in the spread of dangerous and resistant forms of disease.

Now a new technique is fostering some hope that "genetic engineering" efforts can proceed without some of the dangers associated with existing techniques. Scottish molecular biologists Moreen and Kenneth Murray from the University of Edinburgh report in the Oct. 11 *NATURE* the use of a bacterial virus called phage lambda instead of bacterial plasmid DNA as a vehicle for transferring genes from a donor cell to a bacterial recipient.

Plasmids are small circular strands of DNA that multiply alongside the much larger DNA ring in a bacterium like *Escherichia coli* (strains of which live in the human intestine). They have proven useful as vehicles in genetic recombination experiments, for transferring genes from mammalian, amphibian or bacterial donors into bacterial cells lacking the genes. But plasmids often can carry genes for resistance to antibiotic drugs and establish them in bacterial hosts, rendering them potentially impossible to destroy with some antibiotics such as penicillin or tetracycline.

The dangers involved in using plasmids for some types of recombinant experiments were outlined this summer when a group of molecular biologists, with the backing of the National Academy of Sciences, appealed to the scientific community to limit certain types of genetic research (*SN*: 7/27/74, p. 52). A recently discovered class of enzymes called "restriction enzymes" has made gene insertions possible, but, the group stated, has also created potential biohazards. Gene manipulations could result in the bacterial production of deadly toxins, dangerous amounts of cancer-causing agents or diseases which can't be controlled because of bacterial drug resistance. The group called for the voluntary deferment of several types of experiments until a committee can meet at a conference next February to study the risks. Their appeal has been met with attitudes ranging from complete sympathy and voluntary deferment to nose-thumbing disagreement (*SN*: 11/2/74, p. 277).

The Murrays were aware of the potential dangers of using plasmids when