

# War on Hunger

*A Report from The Agency for International Development*

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COVER: Beautiful though they may be, birds such as this perky parrot are in league with other vertebrate pests—bats and rats—to rob man of the food he needs to survive. (See page 9.)

*Photo Courtesy National Geographic Society*

OFFICE OF THE  
WAR ON HUNGER



# War on Hunger

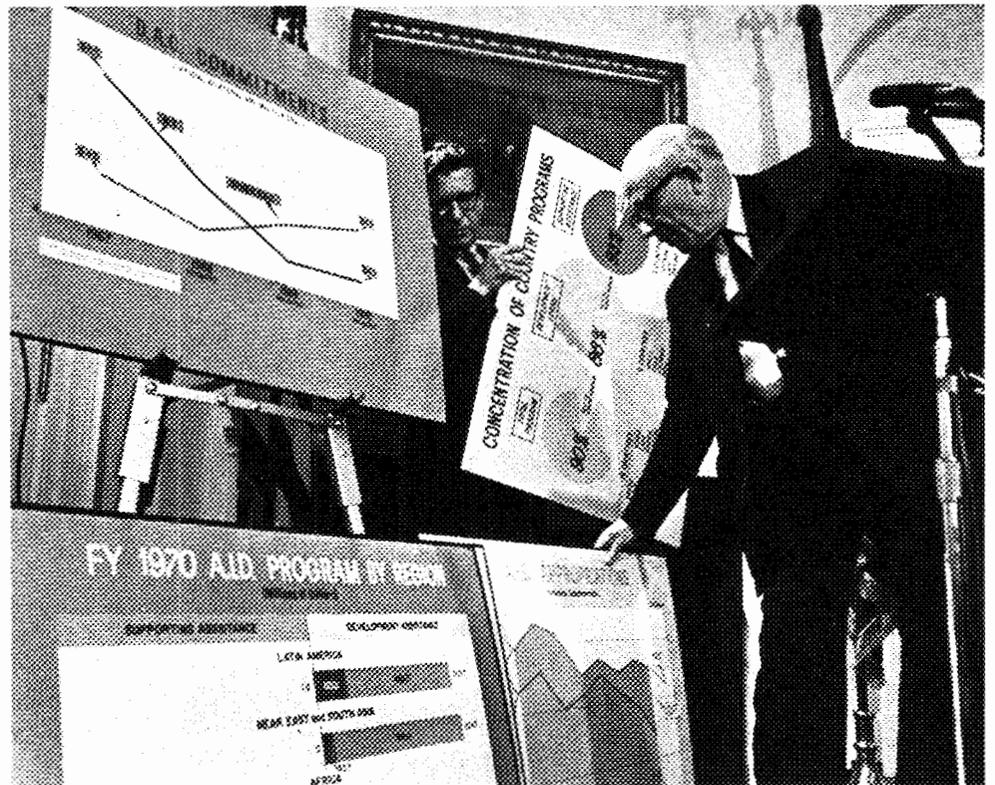
*A Report from The Agency for International Development*

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Agency for International Development.

Dr. John A. Hannah, Administrator

Irwin R. Hedges

Acting Assistant Administrator for War on Hunger



AID Administrator Dr. John A. Hannah (right) and Deputy Administrator Rutherford M. Poats explain current and proposed foreign aid programs to reporters at a White House press briefing.

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Carol H. Steele, Editor

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# WAR ON HUNGER on the Hill



*President Nixon has asked Congress for \$2.2 billion for U.S. assistance to developing nations in Fiscal Year 1970. Agency for International Development and State Department officials are stating the case for foreign aid in a series of hearings before the House Foreign Affairs Committee. Following are excerpts from the President's message and several officials' statements, particularly as they relate to the War on Hunger. Others will appear in future issues.*

## **President Richard Nixon:**

This Administration has intensively examined our programs of foreign aid. We have measured them against the goals of our policy and the goad of our conscience.

Our review is continuing, but we have come to this central conclusion:

U. S. assistance is essential to express and achieve our national goals in the international community—a world order of peace and justice.

But no single government, no matter how wealthy or well-intentioned, can by itself hope to cope with the challenge of raising the standard of living of two-thirds of the world's people. This reality must not cause us to retreat into helpless, sullen isolation. On the contrary, this reality must cause us to redirect our efforts in four main ways:

*We must enlist the energies of private enterprise, here and abroad, in the cause of economic development. We must do so by stimulating additional investment through businesslike channels, rather than offering ringing exhortations.*

*We must emphasize innovative technical assistance, to ensure that our dollars for all forms of aid go further, and to plant the seeds that will enable other nations to grow their own capabilities for the future.*

*We must induce other advanced nations to join in bearing their fair share—by contributing jointly to multilateral banks and the United Nations, by consultation and by the force of our example, and by effective coordination of national and multilateral programs in individual countries.*

*We must build on recent successes in further food production and family planning . . .*

*I propose the establishment of the Overseas Private Investment Corporation. The purpose of the Corporation is to provide businesslike management of investment incentives now in our laws so as to contribute to the economic and social progress of developing nations. . . .*

Simultaneously, I propose a mandate for the Agency for International Development to direct a growing part of its capital, technical and advisory assistance to improving opportunities for local private enterprise in developing countries—on farms as well as in commerce and industry. . . .

*I propose a strong new emphasis on technical assistance. . . . AID is preparing plans to reorganize and revitalize U.S. technical assistance activities. A new Technical Assistance Bureau headed by an Assistant Administrator will be created within AID to focus on technical assistance needs and ensure effective administration of these activities. The bureau will devise new techniques, evaluate effectiveness of programs, and seek out the best qualified people in our universities and other private groups. . . .*

*I propose that we channel more of our assistance in ways that encourage other advanced nations to fairly share the burden of international development. This can be done by:*

Increasing jointly our contributions to international banks.

Increasing jointly our contributions to the United Nations technical assistance program.

Acting in concert with other advanced countries to share the cost of aid to individual developing countries. . . .

This Administration, while moving in the new directions I have outlined, will apply the lessons of experience in our foreign aid programs.

One basic lesson is the critical importance of releasing the brakes on development caused by low agricultural productivity. A few years ago, mass starvation within a decade seemed clearly possible in many poor nations. Today they stand at least on the threshold of a dramatic breakthrough in food production. The combination of the new "miracle" seeds for wheat and rice, aid-financed fertilizer, improved cultivation practices, and constructive agriculture policies shows what

is possible. They also demonstrate the potential for success when foreign aid, foreign private investment and domestic resources in developing countries join together in a concerted attack on poverty. . . .

The proposed budget includes new appropriation of \$2,210 million for AID, \$138 million below the January budget request of the previous Administration. In addition, the budget includes \$75 million to augment existing reserves for guaranties to be issued by the proposed Overseas Private Investment Corporation.

The appropriation request for economic assistance will support these regional programs:

For Latin America, \$605 million.

For the Near East and South Asia, \$625 million.

For Africa, \$186 million.

For East Asia, \$234 million.

And for Vietnam, \$440 million. . . .

The support by the Congress of these programs will help enable us to press forward in new ways toward the building of respect for the United States, security for our people and dignity for human beings in every corner of the globe.

**John A. Hannah, AID Administrator:**

Through foreign aid, the American people express their humanity toward their fellow-men and, at the same time, strengthen friendly countries economically, politically and militarily. Our foreign aid programs have been a good investment. . . .

There have been some dramatic successes. For example, U.S. assistance programs played a major role in bringing Israel, Taiwan, Iran, and Greece to self-sustaining growth. Korea and Turkey should join their ranks soon.

The "Green Revolution" now sweeping South and East Asia stems in large part from the fertilizer, pesticides and high-yield seeds that AID Development

Loans have put in the hands of Asia farmers. The agricultural extension services, the agricultural universities, and educational programs backstop continuing progress. . . .

The critical imbalance in too many developing countries between food production and population growth requires our highest priority. Overpopulation and underdevelopment go hand in hand. The nation with population growth equal to or in excess of economic growth is in real trouble.

We shall continue to invest as much as can be wisely and effectively used in the solution of the associated problems of food production and population growth. The developing nations require far greater capital investment for fertilizer, pesticides, water resources, and other essential inputs. . . .

An adequate nutritional level requires more than full stomachs. Adequate diets are not only essential for good health, but are basic to the success of voluntary family planning programs. In addition to nutrition programs, development and support for maternal and child health clinics are important. We are becoming increasingly convinced that only when the poor farmer or urban laborer and his wife feel secure that their children will survive in good health will they willingly accept the need for family planning. . . .

Even if all forms of private investment are counted, the United States is now devoting less than two-thirds of one percent of our GNP to economic aid, while other countries are moving toward compliance with the one percent of GNP goal set by the United Nations and the OECD. . . .

**Elliot L. Richardson, Under Secretary of State:**

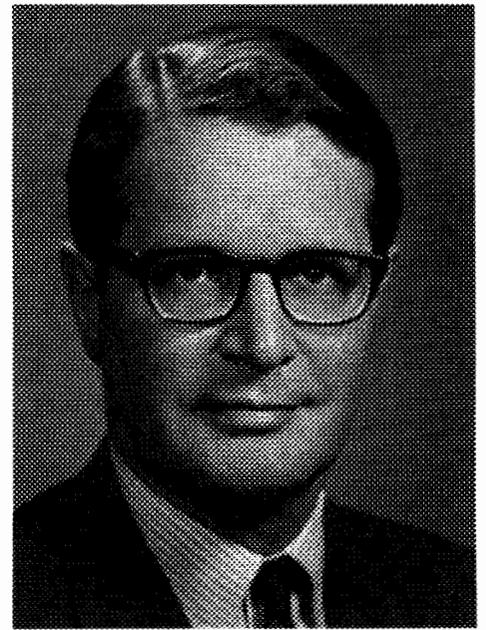
United States aid programs are a critical chapter in the unfolding story of the post World War II era. Many of our strongest and most dependable allies are past and present recipients of American aid. United States



RICHARD M. NIXON



JOHN A. HANNAH



ELLIOT L. RICHARDSON

cooperation in development projects represents our single strongest tie to the developing nations, where two-thirds of the world's people live. Development, which will bring a higher quality of life, is the primary goal toward which these nations struggle. To turn our back or disassociate ourselves from this drive now would ultimately imperil not only them but ourselves. . . . We have learned at home that neglect of the poor and underprivileged can have explosive effects. It is only prudent to apply that lesson to a world which is growing ever smaller and more interdependent. . . .

Major breakthroughs in food production seem imminent in many aid-receiving countries. The widespread introduction of newly developed hybrid strains of rice, wheat and other grains through our AID programs has already brought about dramatic increases in agricultural productivity in India, Pakistan, Turkey, the Philippines and elsewhere. Last year's wheat harvest in Pakistan and in India were up over 35% above the previous records—an increase without precedent.

At the same time, official family planning programs have been undertaken in more and more AID-assisted countries, and population pressures are being recognized throughout the world as a challenge to be faced. Thus the prospects of mass starvation within a decade that many experts predicted seems to have been forestalled. . . .

**Paul G. Clark, Assistant Administrator for Program and Policy Coordination, AID:**

For private enterprise to contribute most effectively to development, it needs a framework of effectively-working commodity, labor, and financial markets. Prices should be free to function, and private producers free to respond to market opportunities. In our negotiations with host governments, AID actively encourages free market policies.

The largest group of private producers in developing economies are farmers. The most encouraging news in years is that in many countries, particularly in Asia, agriculture is now in the early phase of an unprecedented breakthrough in food grain production. This would not have been possible without new seeds and fertilizer. But key policy actions which AID has encouraged have contributed significantly to this opportunity. These policies include freer and more rewarding prices for farmers' products, and freer markets for production and distribution of fertilizer and other inputs.

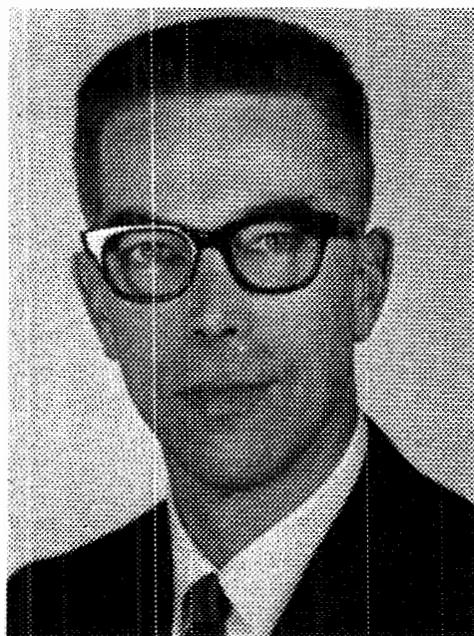
To illustrate: In India last year wheat production was 35 percent above the maximum previous level, and production of all food grains combined was 10 percent above the previous peak. Two years before, with U.S. encouragement, the Government of India established a new policy of freer and higher procurement prices. Farmers have responded to the new technical opportunities and these production incentives. Since then, as food grain production has expanded, geographical trading areas for wheat have been completely eliminated. . . .

**Robert S. Smith, Acting Assistant Administrator for Africa, AID:**

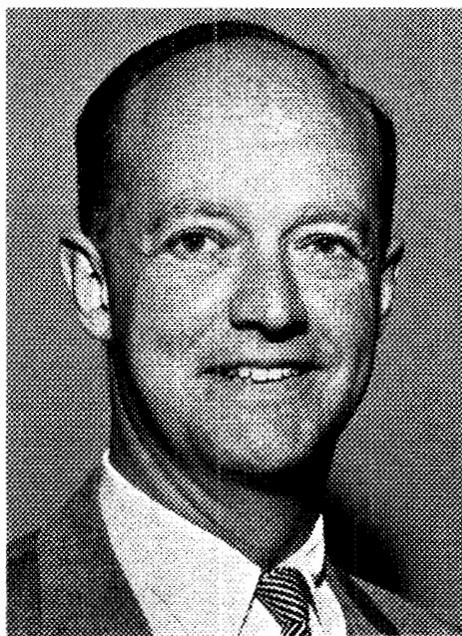
. . . In Ethiopia, we propose to initiate one or more rural development "packages" involving substantial inputs of technical and capital assistance. Assistance to the local population in increasing agricultural output will be part of a broader rural development program including efforts to improve the quality of rural life. . . .

For example, in the Shashamane area, we will bring together improved cultivation practices, agricultural credit, marketing services and new seed varieties to stimulate the development of commercial agriculture by small and medium sized farmers. Increased in-

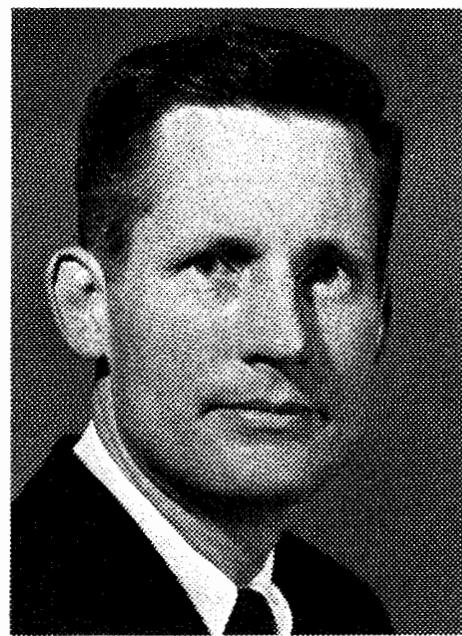
*Continued on p. 19*



PAUL G. CLARK



ROBERT S. SMITH



ROBERT H. NOOTER

The Agency for International Development's recent intensive review of new cereal varieties is expected to play a vital role in planning future agricultural assistance.

Primary targets of the study were the "miracle" wheat and rice varieties. Corn was also included because it is the most important food crop in Latin America, because the introduction of hybrid corn in some areas has had a payoff and diffusion rate as impressive as wheat and rice, and because it provides a useful comparison with the others.

Thirteen countries were selected for study—India, Pakistan, Turkey, Thailand, the Philippines, Vietnam, Morocco, Kenya, Mexico, Colombia, Paraguay, Brazil and El Salvador. Most are successfully using the new seeds, but in others the seeds have not done well or a technologically successful program is being carried on without the seeds.

A detailed series of reports were presented. Country Crop Papers told the basic history of each selected crop in a particular country. Global Crop Papers, one each for wheat, rice and corn, were prepared to analyze worldwide experiences and reach some conclusions about significant factors for success in some countries and failure in others. Functional Papers, drawing material from those already listed, offered insights on two main issues: (1) why the high yield varieties have been adopted at unprecedented rates almost everywhere they were introduced, and (2) what problems are emerging from these successes. They were presented at the review as a springboard for formal discussion. Issues Papers highlighted the principal items raised in other statements.

War on Hunger plans to publish some of these papers from time to time in future issues.

Among those from non-government institutions who took part in the review were: John Mellor, Cornell University; W. E. Kronstad, Oregon State University; S. A. Eberhart, Iowa State University; Floyd L. Corty, Louisiana State University; E. N. Eiferson, LSU; R. C. Buse, University of Wisconsin; Lester Brown, Overseas Development Council; Gustav Ranis, Yale University; A. J. Coutu, North Carolina State University; James Grant, Overseas Development Council; Mervin Smith, Ohio State University; Woods Thomas, Purdue University; John Murdock, University of Wisconsin; Theodore Schultz, University of Chicago; Sterling Wortman, Rockefeller Foundation; A. H. Moseman, Agricultural Development Council; Glenn L. Johnson, Michigan State University; Lowell Hardin, Ford Foundation; Vernon Ruttan, University of Minnesota; W. D. Hopper, Rockefeller Foundation, and Arthur Mosher, Agricultural Development Council.

# A look at AGRICULTURAL DEVELOPMENT STRATEGY

By Irwin R. Hedges

The outlook for eventual closing of the food/population gap in developing countries has recently undergone a sharp improvement. This is due in very large measure to the significant increases in grain production and marketing which have occurred in some of the areas formerly most seriously affected by food shortages.

These increases are a direct result of the introduction of the new high-yielding varieties of wheat and rice and, to a lesser extent, corn and sorghum, together with an improved agricultural technology and a greater dedication on the part of government to policies that must be pursued if agriculture is to play its proper role in the overall development of these countries.

While the most spectacular successes have been scored in Asia, notably India and Pakistan, substantial improvement in wheat production is also taking place in Turkey and North Africa. The Philippines have now met their domestic needs for rice for the second successive year. Substantial efforts to increase rice production are also under way in Indonesia.

## Extensive Review

The Agency for International Development, as a part of its Spring Program Review process, has undertaken an examination in depth of the experience with high-yielding cereal varieties for clues about the nature of farming in developing nations and for



*Irwin R. Hedges is Acting Assistant Administrator of the Agency for International Development's Office of the War on Hunger. This article was written for War on Hunger.*

guidance as to appropriate agricultural sector strategy and, indeed, broader developmental strategy in the future.

Although the review focused on the high-yielding varieties of wheat, rice and corn—a natural outcome since food grains account for nearly 85 percent of agricultural production in the less-developed countries (LDCs)—the discussion was wide-ranging and covered general problems of agricultural development.

To assist AID in the review, an impressive roster of outstanding talent in the field of international development was assembled from universities, private foundations and other government agencies. Experience of countries which have achieved marked success in expanding cereal production was examined in depth with a view to determining the factors which contribute to this success. Attention was also given to certain other countries whose recent experience in expanding food production has been less impressive, with the aim of identifying the missing elements which contributed to these failures.

The "agricultural revolution" has been concentrated essentially in spring wheat and rice, principally in the countries of East and South Asia, and confined almost entirely to areas with ample water supply. Even in the countries which have benefited the most, the "revolution" has so far directly touched only a minority of the farming population.

#### **Essentials for Growth**

Nevertheless, in breaking the mold of traditional agriculture and in demonstrating the results that can follow the introduction of new technology, the way has been opened to further change. Effort must now be made to capitalize on and to extend the opportunities for agricultural growth which now exist.

In view of the limited experience to date with the high-yielding varieties, caution is required in drawing

conclusions or generalizations with respect to agricultural development strategy. The workshop, however, was able to sort out the essentials for a marked acceleration in agricultural growth. Three essential components were identified as present in every instance where a marked success has been achieved with the high-yielding varieties:

1. *The operational component.* The supply of inputs, particularly fertilizer, water, technical supervision and management.

2. *The technical component.* The availability of high-yielding seeds capable of showing a quantum improvement over traditional seeds when combined with knowledge of the cultural practices and the technology required to assure realization of the potential of these seeds.

3. *The economic component.* An adequate cost/price incentive provided where required by government-assured prices for the resulting output.

Finally, these components must be associated with an adequate rural infrastructure, including local distribution of inputs, roads and transportation, credit facilities as required, agricultural extension and information services, and assured market outlets for the resulting increased output.

#### **Total Development**

There is no assurance that the high-yielding varieties have sparked a sustained revolution in agricultural development in the developing countries. Indeed, there was general agreement that only to the extent that a proper assessment is made of the role of high-yielding varieties in the overall agricultural development process and a proper perspective maintained will the potential of the new seeds be realized. In other words, we must not lose sight of the total development process by attaching undue significance to one particular element, i.e. the high-yielding seeds.

It is only where the essential components of a development strategy, as enumerated above, were in place, or the capability existed of rapidly putting them into place, that dramatic results have been achieved. If the agricultural development process is to continue to move forward, attention must continue to be given to the basic essential elements—research, extension, education, infrastructure, economic incentives, etc.

It would be a serious error to concentrate in the future on single crop campaigns at the expense of continuing to work on these essential components of agricultural development strategy. Single crop campaigns viewed in this context are expeditious, and by offering the possibility of tangible results can strengthen the other basic essential components of the development process.

This view enhances rather than minimizes the role of the high-yielding seeds. Slow progress in the past may well have been in large part due to the lack of

*Continued on p. 16*

# Population Organization

By Phyllis T. Piotrow

Are the advocates of family planning and population control practicing what they preach?

With the explosion in worldwide population has come an apparent explosion of funds, foundations, institutes, organizations, associations, councils, committees, and campaigns to deal with it—not to mention a growing number of government programs. To the general public and the government officials which encounter all the private groups, it may seem that this proliferation calls for more control among the birth controllers.

To the initiated, however, it is just as important to have a variety of different organizations involved as it is to have a variety of different birth control methods in a clinic. What suits one person or situation will not suit others, and so a variety of different programs have sprung up at different times, under different auspices, with different goals, and one might add even in this field, with different degrees of affluence, ranging from the dignified suites of the Rockefeller Foundation all the way to the dusty mobile unit of Bill Baird's Parents' Aid Society.

## Planned Parenthood Federation

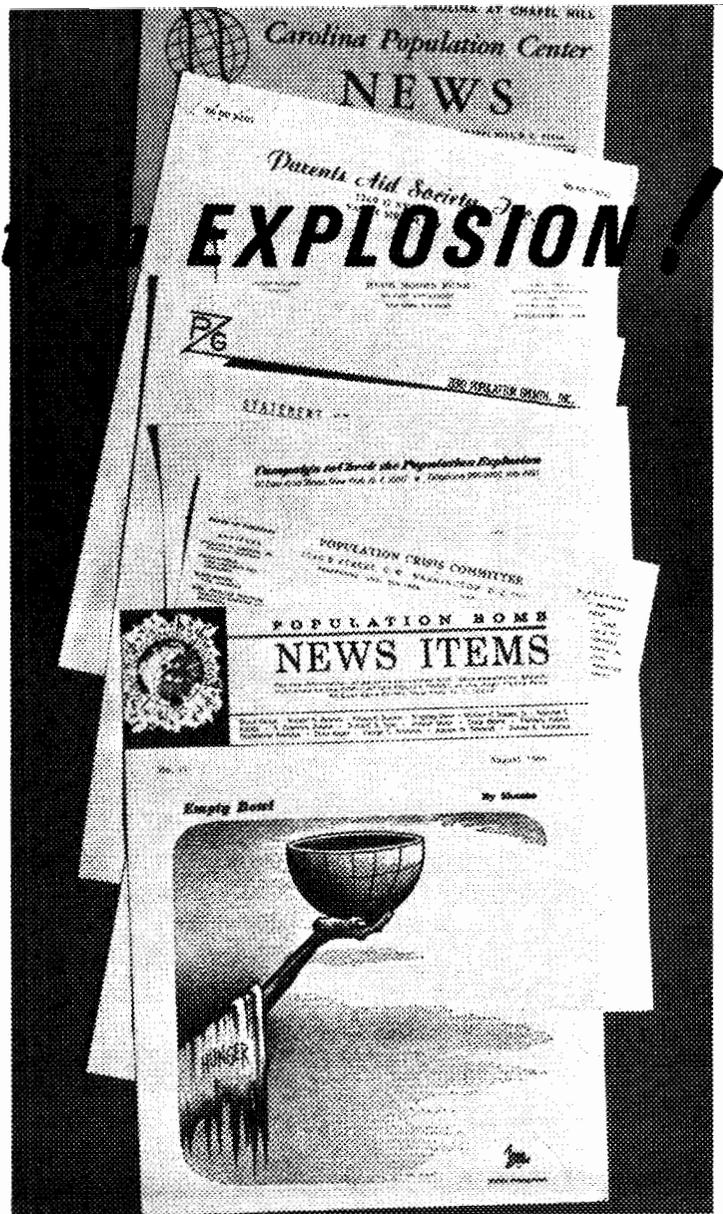
A brief catalogue of the principal non-governmental groups involved may be useful: The grandmother of today's population organizations is the *Planned Parenthood Federation of America* (515 Madison Avenue, New York, N.Y. 10022), originally founded by Margaret Sanger in 1917.

A clinic in the Brownsville section of Brooklyn was the start of the organization which today boasts 166 affiliates running over 500 clinics in the United States as well as a wide range of educational activities. Originally an organization of interested volunteers, Planned Parenthood is now recognized as a competent and qualified member of the National Health Council. Alan Guttmacher, the president, is nearly as well known as Dr. Spock.

The newest Planned Parenthood program is a Center for Family Planning Program Development to provide technical assistance in the United States—which has been called "an underdeveloped land in family planning"—for better family planning services. In 1968, Planned Parenthood raised nearly \$20 million directly or indirectly for birth control in the U.S. and overseas.

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*Mrs. Piotrow is Executive Director of the Population Crisis Committee. The accompanying article was written expressly for War on Hunger.*



The Planned Parenthood Federation of America is a member—in fact, one of the founding members—of the *International Planned Parenthood Federation*, or IPPF (18-20 Lower Regent Street, London SW 1, England).

The IPPF consists of 57 member national organizations ranging from the 50-year-old nationwide U.S. organization to the newly affiliated Family Planning Associations of El Salvador and Tunisia.

IPPF is the only truly international private, voluntary family planning organization. It operates from an increasingly professional London headquarters on a budget that has grown from less than \$1 million in 1965 to \$8.5 million in 1969, with assistance from AID and half a dozen national governments.

As David Owen, former Co-Administrator of the United Nations Development Program, assumes the position of Secretary General, the IPPF looks forward to a growing role. Virtually all of the indigenous family planning association members are becoming steadily more active—building the public support necessary to encourage nationwide programs in their own countries or, where government actions are already underway, stimulating new approaches and new efforts.

The IPPF maintains a *Western Hemisphere Region Office* in New York (51 E. 42nd Street, 10017) which offers technical assistance and support to Latin American and Caribbean programs.

### Financial Drive

Much of the financial drive behind the IPPF was generated by the *Victor Fund* and the *Victor-Bostrom Fund* (both at 1730 K Street, N.W., Washington, D.C. 20006) under the chairmanship of General William H. Draper, Jr. Alexander Victor of Victrola fame left a bequest of \$150,000 to fight overpopulation. Since 1965 General Draper has been traveling the length and breadth of America coaxing some 60 other donors to match that sum for a total of \$9 million and keep the IPPF program in high gear.

The volunteer agencies were the first in the birth control field. Margaret Sanger and a dedicated cohort of feminists saw family planning as a woman's right and a vital part of family welfare. But, as the problems of population growth began to have a conspicuous impact not just on the individual woman or family but also on the economic wellbeing of nations, then businessmen, scientists, and philanthropists began to take a greater interest.

### Foundations Enter Field

*The Rockefeller Foundation* (111 West 50th Street, New York, New York 10020), founded in 1913, gave early support to biomedical research in fertility control, beginning in the 1930's. Its pioneering work in agriculture has made possible the recent explosion in world food production through the use of "miracle" wheat and rice strains. In the population field, its grants, now running about \$3 million annually, support medical research, conferences, seminars, and a variety of projects.

But the Rockefeller Foundation was not doing enough. John D. Rockefeller 3rd, Chairman of the Board, decided in the early 1950's. Therefore, in 1953 he established *The Population Council* (245 Park Avenue, New York, N.Y. 10017).

In its early years, the Council provided fellowships and emphasized research and training in demography and biomedical sciences. Then, as governments overseas—far ahead of the United States in recognizing the population problem—began to ask for advice in setting up nationwide birth control programs, The Population Council moved into the technical assistance field.

Today, The Population Council has an annual budget of about \$12 million, some 150 persons in 16 professions working in 15 countries and receives substantial AID grants.

As an advisor to governments, The Population Council is perhaps best known for its work in the pioneering and thus far successful programs of Taiwan and Korea. In the contraceptive development field, its activities range from evaluation of IUDs to development



**While you're eating dinner tonight, 417 people will die from starvation.**

The Campaign to Check the Population Explosion has published a series of ads, including the one above, to bring the population crisis to the attention of the public.

*The Campaign to Check the Population Explosion has published a series of ads, including the one above, to bring the population crisis to the attention of the public.*

of an implant capsule and work on a once-a-month pill.

### Institutional Grants Important

*The Ford Foundation* (320 East 43rd Street, New York, N.Y. 10017) started to provide assistance for population work in 1952 and soon established a full-fledged program under Oscar Harkavy with about 30 professional staff members.

By 1968, the Foundation had provided \$100 million for population and family planning activities—more than any other agency, public or private—and about six percent of the Foundation's total commitments. The population program, which has been one of the least controversial of the Foundation's recent efforts, has put strong emphasis—over half of the funding—on research and fellowships in reproductive biology.

Institutional grants to U.S. universities for interdisciplinary population centers and technical assistance in India, Pakistan, and elsewhere have been an important part of the Ford program. Ford Foundation officials have recently put renewed emphasis on the need to develop new and better methods of birth control to solve the world's population problem.

A number of other private organizations have been directing their efforts for several decades toward reaching and teaching individuals about family planning and/or population.

*The Pathfinder Fund* (1575 Tremont Street, Boston, Mass. 02149) was founded by Dr. Clarence Gamble (of Procter and Gamble) who began in the mid-twenties to pioneer family planning with individual doctors.

Providing supplies and encouragement to the very first groups who dared to undertake birth control work, the Pathfinder Fund, with AID assistance, still operates on a flexible one-to-one relationship with doctors around the world, evaluating new IUDs, offering pills and other contraceptives, or promotional literature, or simply advice and encouragement on the next steps toward a bigger program.

In the history of family planning activities around the world, it is noteworthy how many projects were born as a result of a visit or a tea party with a Pathfinder representative.

The gospel of family planning has also been included in overseas programs of a number of church groups—Church World Service, The American Friends Service Committee, the Methodist Church, World Neighbors, and medical missionary activities—to name but a few. Supplying commodities, clinics, advice, and encouragement are part of their foreign actions. In the United States new effort is being made to put the population problem on the agenda of social concerns. Next summer, for instance, the National Council of Churches is planning a major conference to alert U. S. and foreign church leaders to the dangers of the worldwide population crisis.

*The Population Reference Bureau* (1755 Massachusetts Avenue, N.W., Washington, D.C. 20036), founded in 1929, does not deal with birth control, but the facts and figures it presents about population are enough to convert almost any individual to the need for some kind of restraint.

### Population Information

If you want to know how many people ever lived on earth, or what population growth has done to the State of California, or how long it will take Botswana to double its present population, the Population Reference Bureau has the answer.

Information and reference materials in English and Spanish (distributed from an office in Colombia), a soap opera in Central America, and guides for primary and secondary school courses (demography, not sex education) are among its varied activities.

*The Hugh Moore Fund* (60 East 42nd Street, New York, N.Y. 10017), founded in 1944, has been unique in concentrating heavily on newspaper advertising to alert the reading public to the bomb-like potential of the population explosion. The Fund works closely with the *Campaign to Check the Population Explosion* (Chairman Emerson Foote, 60 East 42nd Street New York, N.Y. 10017), which has run some 20 ads, mainly in New York and Washington papers, with the slogans "The population bomb keeps ticking" and

"Whatever your cause, it is a lost cause unless we can check the population explosion."

### Promoter and Catalyst

*The Population Crisis Committee* (1730 K Street, N.W., Washington, D.C. 20006) was established in 1965 to stimulate public and private interest in the present population crisis. An educational organization with no program except to spur on the work of others, the PCC is a catalyst, a gadfly, and a promoter of new enterprises.

First under the chairmanship of former Senator Kenneth B. Keating and now General William H. Draper, Jr., the Committee sponsors meetings, discussions, luncheons, and various publications to air the world-wide issues.

The latest additions to the population club are almost too young to be classified. The *Parents' Aid Society* (1269 G Street, Valley Stream, N.Y. 11580) of William Baird provides peripatetic birth control advice in a mobile unit furnished as a livingroom. In and out of jail more often than Margaret Sanger, Baird calls Planned Parenthood "a Part of the Establishment". Perhaps 20 years from now others will be saying the same thing of Baird. Age seems to bring "respectability" in the population field as elsewhere.

*Zero Population Growth* (Box 147, Old Mystic, Conn. 06372) is headed by Stanford biologist Paul Ehrlich. It publicizes the idea that in families *big is bad* and 2.3 children per family is enough for the United States. At a zero rate of population growth, the average age of the population would eventually be about 37—a comforting thought to college administrators, if not yet acceptable to U.S. businessmen.

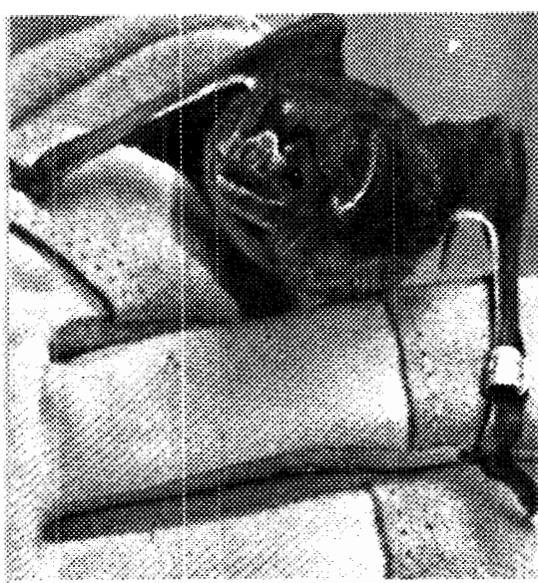
### Next in Line?

What next? The biggest gap in family planning groups so far is that most of the individuals involved in them are over 40 already. Perhaps the newest addition will be a Junior Planned Parenthood or S.D.S.—Students for a Demographic Society—to enlist the coming generations in the struggle against overpopulation. The university population centers—like North Carolina, Michigan, Harvard, California, Berkeley, Pittsburgh, Chicago, or others—may be the catalysts in starting such a movement. But whatever the next organization is, one can expect that it will be viewed with some suspicion at first.

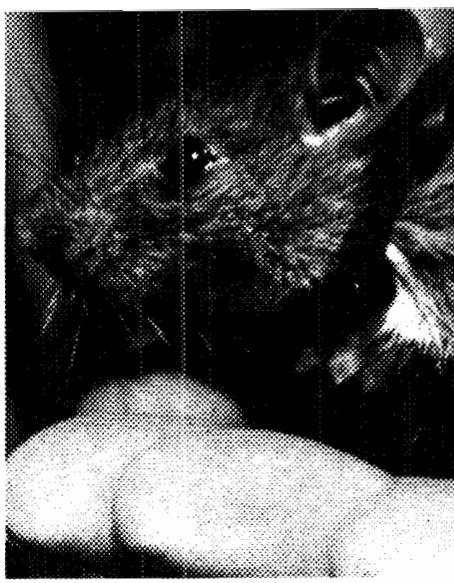
The fact is that both knowledge and opinions in the family planning and population field are changing so fast that no one organization can reflect all the different approaches and possibilities. In the race against overpopulation, competition may be the best spur to achievement.

The more organizations existing in the 1970's to deal actively with the population crisis, the fewer people will probably exist in the 2070's to blame us for despoiling the planet and degrading the quality of human life.

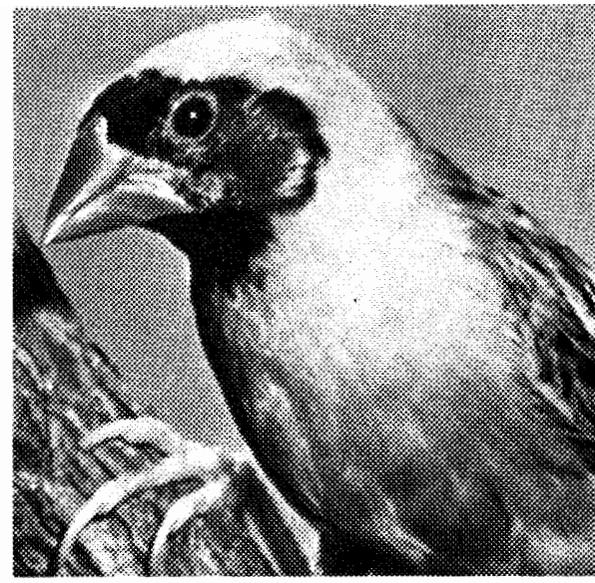




*Technician uses heavy leather-lined gloves for protection from rabies while studying the vicious little bat.*



*Tiny radio transmitters attached to rats help scientists study their movements and life habits.*



*He looks harmless enough on his perch, but the Quelea bird of Africa is probably the world's most destructive.*

# Bats, Rats, Birds and *HUNGER*

By Charles L. Cadieux

In a building in Denver, Colorado, a tiny bat hangs head downward from a wire screen covering the top of an ice cream container. He sleeps most of the day, but when a white-uniformed technician fixes his feeding tray to the side of his cardboard home, he comes to life, moves warily to the feeding dish and laps his liquid food. In a few minutes he drinks a surprising amount into his furry body and goes back to his sleeping position.

In a limestone cave in an isolated valley in eastern Mexico, another bat awaits the coming of darkness before leaving his daytime retreat. He flies to a cattle corral and lights on the neck of a cow. Using vicious looking incisors, he cuts a tiny slit in the cow's skin. Then he greedily sucks his liquid food.

Both the bat in Denver and the bat in Mexico drink the same food—blood! And throughout tropical Central and South America, this vicious vampire bat levies a toll on cattle.

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*Mr. Cadieux, Conservation Education Coordinator for Region II for the Bureau of Sport Fisheries and Wildlife, wrote the accompanying article at the request of War on Hunger.*

transmitting rabies which is blamed for the deaths of nearly a million cattle a year and huge weight losses in millions more.

## Animal Vs. Man

To stop the death-dealing bats and to keep those other vertebrate pests—rats and birds—from eating the food so desperately needed by humans, the Denver Wildlife Research Center of the Bureau of Sport Fisheries and Wildlife has been enlisted in the War on Hunger under an Agency for International Development contract.

Since the contract was signed in mid-1967, Bureau scientists have established headquarters for research and control programs in the Philippines, Mexico, and at the Denver backup center.

Rodent damage surveys have been conducted in Vietnam, Thailand, India and the Philippines, and a Rodent Research Control Center has been established at Los Banos in the Philippines. Bird damage surveys have been carried out in Venezuela, Colombia, Costa Rica, Nicaragua, Honduras and Mexico. Field testing of possible relief methods is under way.

In the control of damage caused by rats and birds, personnel of the Den-

ver Center can call on long years of experience with similar problems in the United States. The vampire bat, however, poses an entirely new problem, and the scientists must start from scratch.

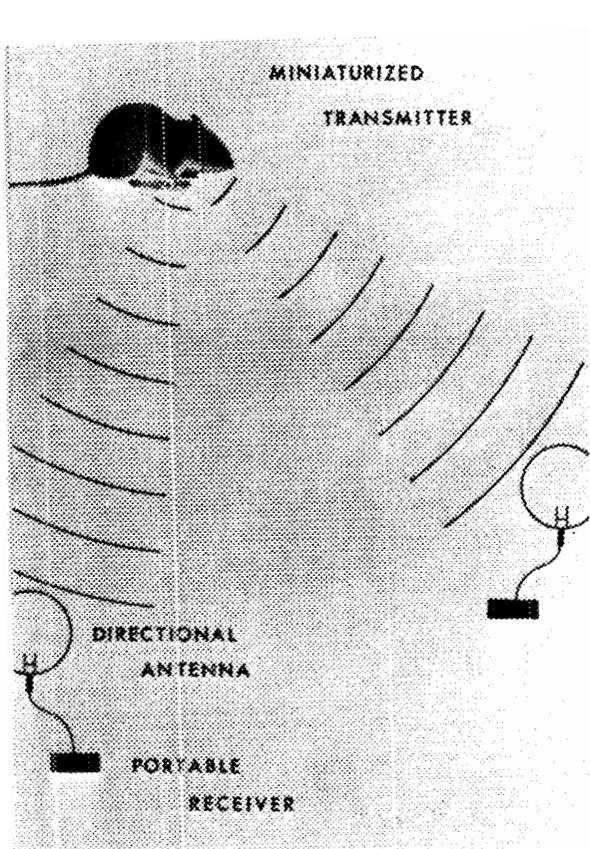
Field investigations into the control of bats are being held at Palo Alto, near Mexico City. Here, scientists are studying the life habits of the tiny creatures, seeking a weakness which can be exploited to reduce their numbers.

## Bugging the Bats

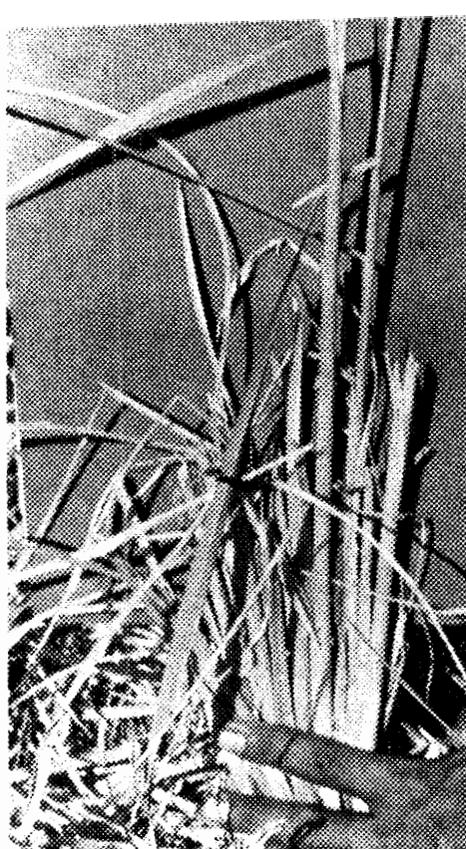
Using Denver-developed radio transmitters which weigh little more than a copper penny, the BSWF-AID team is monitoring the movements of the blood-eating flying draculas. Many vampire bats in a test area west of Tampico are already outfitted with the tiny transmitters which beep out a constant stream of information about the bats' whereabouts.

The transmitters will help scientists learn how far bats range in search of food, whether or not they return to the same caves each day, whether or not they have a seasonal migration, and how they locate their prey in the dark.

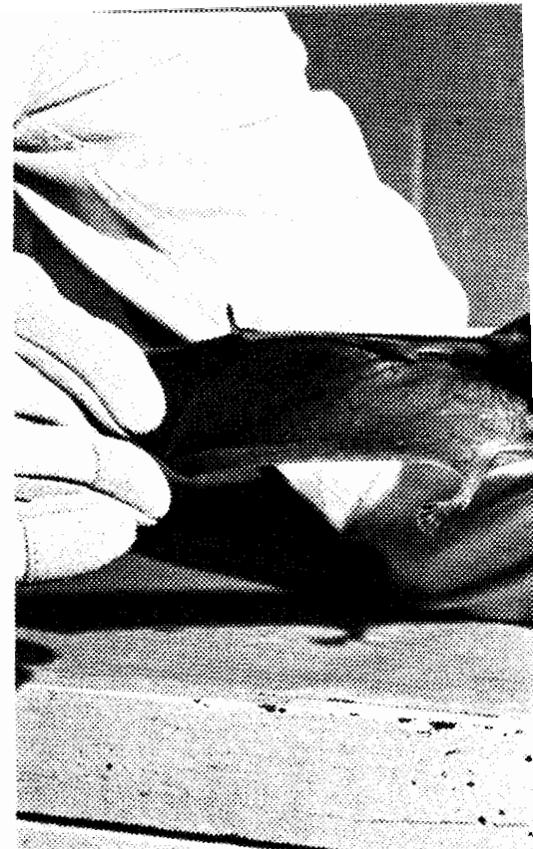
In the Denver Research Center, research physiologists are conducting



*The animals are located by triangulation with directional antenna and portable receiver sets.*



*Rice tillers cut by rats. Losses of as much as 10 percent of the expected rice yield have been caused by rats.*



*Vampire bats feed only on blood, fly blood to blood solids in a very few minutes weakness in these highly specialized creatures.*

basic research on a colony of nearly 100 bats maintained in captivity. According to Center scientists, the vampire is a highly specialized mammal. It feeds only on blood, flies only during darkness, has a very efficient digestive system which enables it to reduce whole blood to blood solids in a very few minutes, and has a long period of gestation which gives a slow rate of reproduction. Scientists feel that this very specialized nature may allow them to single out a weakness to be used against the creatures.

#### **Rats and Rice**

In the Philippines, scientists are trying to find an answer to the loss of rice—the world's foremost food crop—to rats. In the province of Cotabato on Mindanao, Denver-based scientists have documented losses of rice to rats which amount to 10 percent of the expected yield in the areas studied.

Well aware of the seriousness of the problem, the Philippine Government is contributing both money and skilled personnel to the work headquarters at Los Banos, on the island of Luzon.

Experts from the Denver Wildlife Research station, with long experi-

ence in research on rodents in America, are field-testing methods of reducing the staggering loss of rice. According to a Philippine official, the yearly loss of rice to rats is greater than the annual rice consumption of one million people.

With expanded production, the rat problem can be expected to increase. Indications of this may be seen in records kept at the Philippine headquarters of the International Rice Research Institute, where the IR-8 "miracle rice" was developed. An electric fence around several experimental plots at the Institute killed 22,746 in 1965 and 25,436 in 1966.

Denver Wildlife Research Center scientists are evaluating the effects of various types of toxicants and studying the behavior of the various types of rats which ravage the rice fields.

Here, too, tiny transmitters are used to help researchers discover where the rats live, when they feed and how far they normally range from their homes. Because radio telemetry plays such an important part in the teams' research studies, the Denver Center's excellent electronics laboratory is of major importance. Scientists caution, however, that electronics provides only basic

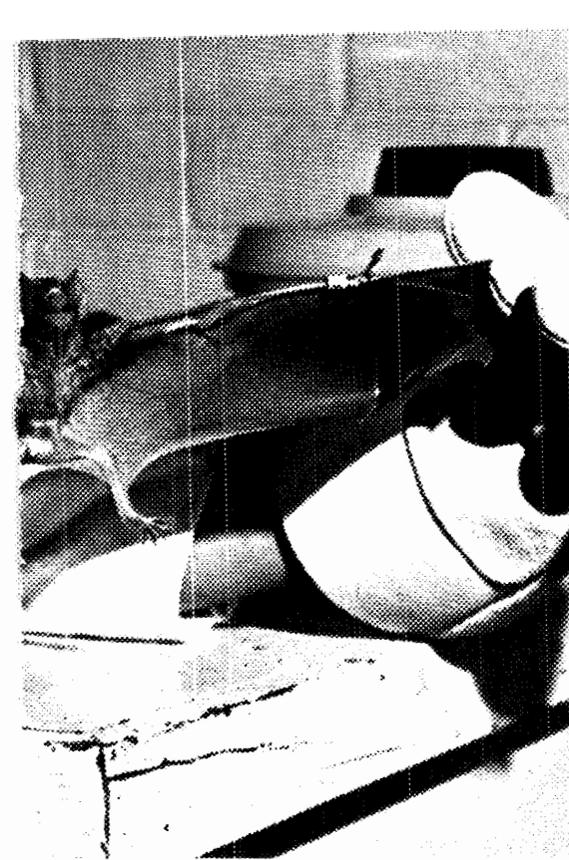
information.

The most important requirement for researchers is to learn which methods of control are best suited to a particular species causing the loss of mankind's food. Then the methods must be modified to fit the social and economic conditions of the countries involved.

#### **Battling the Birds**

Throughout Central and South America, great quantities of human food are eaten by birds, many of which are residents of the United States during the summer and spend their winters in warmer climes. Thus, in attempting to solve the bird damage problems in Latin America, the program will attempt to adapt damage control methods now being developed in the United States to the differing situations found down South.

Grain crops most commonly damaged by birds in Latin America are grain sorghum, corn, rice, wheat, and soybeans, in that order of importance. The birds doing most of the damage, according to the growers, are members of the blackbird, sparrow, parrot, dove and duck families.



ily during darkness, and reduce whole ites. Scientists hope to locate a strategic atures—and use it against them.



Blood-sucking vampire bats wound cattle, often causing rabies and death, thus affecting the food supply.



Bats are closely observed in containers at the Denver Laboratory to learn their habits and devise controls.

Biological methods of controlling bird damage include the adjusting of planting dates to avoid concentrations of birds, particularly of the migratory species. Field studies indicate that shifting the planting dates only a few weeks will bring a crop to maturity before the marauding birds arrive or after they have departed.

There is also great hope for a program which will utilize bird-resistant varieties of crops. One of the most interesting reports of the early BSWF-AID investigations shows that a high tannin variety of grain sorghum is almost untouched by birds, while more common varieties in adjoining fields suffered damage as high as 70 percent of the total expected yield.

Physical methods of combating bird depredations include the use of frightening devices and traps to take the offending birds. Trapping has proved too costly and time-consuming in the United States, but Latin America's huge pool of manpower and low labor costs make this method feasible.

One of the methods tried with some success is the use of a chemical frightening agent which causes the

birds to behave unnaturally. The birds utter distress calls, which seem to get the message across to thousands of their brothers, causing an abrupt departure from the area.

Chemical methods have proved most productive in the United States, and their use is being studied in Latin America. Toxicants, repellants, and stupeficient drugs are well-known in bird control work and may prove effective in the new study areas. However, the Center reports that they know very little about the reaction to be expected when these drugs are used on new species. They have no experience with the parrot family, for example, and have already learned that different dosages are required to produce the desired results on Latin American species.

Bird damage control technicians working under the AID-BSFW program are surveying the problem in Latin America and beginning limited field testing work in Mexico and Nicaragua. A bird control field station is being planned, and will probably be located in Colombia.

Now under consideration is a project to try to develop effective control procedures for Africa's Quelea bird, which is probably the most

destructive single bird species. From Nigeria and Senegal to the Sudan and Tunisia, large crop areas are totally destroyed by the Quelea bird each year.

Despite intensive field programs, ranging from scare devices to fire bombings and spraying nests with lethal chemicals, the bird populations are being maintained and in many instances have actually increased because of more intensive agricultural production. Crop losses exceeding \$7 million per year have occurred in Africa since 1960.

Trying to keep the world's destructive rats, bats and birds under control is an immense undertaking and, at times, a dangerous one. Researchers trapping bats and rats for study are always in danger of contracting rabies from the bats and plague from the rodents.

However, one senses a high degree of dedication and a feeling of urgency when talking to the researchers working on Agency for International Development teams in foreign countries. The reason is obvious. "After all," one of them said, "we're talking about feeding hungry people. Is anything more important?"



# THE TECHNICAL FRONT

## ***HERBICIDES Herald New Era in Weed Control***

**By Dr. William R. Furtick**

Weed control is as old as agriculture. The earliest farmers slashed and burned the forests to get rid of unwanted vegetation and provide a clear area for planting their crops. Then, to protect the food crops and give them room to grow, farmers pulled weeds by hand or used hand hoes to destroy them. Draft animals joined the constant battle against weeds by pulling various types of weeding implements, such as cultivators.

Until the last few decades, the major advances made in weed control involved speeding up these activities through the improvement of implements that could be pulled more rapidly with tractors as the more advanced areas of the world began to mechanize agriculture.

The rapid increase in agricultural production efficiency in North America and Europe since World War II has been intimately associated with the use of new chemical weed killers, herbicides. They have yet to make an initial impact in many areas of the world, however, and many farmers are still hand pulling weeds as their ancestors did.

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*Dr. Furtick is Director of the International Plant Protection Center at Oregon State University, which is studying the control of weeds in the developing countries under a research grant from the Agency for International Development. This article was written especially for War on Hunger.*

To help developing nations decide whether weed control measures are needed and which ones may be used most effectively and safely under a wide variety of conditions, the Agency for International Development is supporting an expanding level of research through a contract with Oregon State University.

Studies are now underway in Colombia and Ecuador, and extension information covering the impact of weeds on crop production is becoming available. The need for herbicides is clearly indicated.

### **Herbicide Development**

Shortly before World War II, various inorganic salts and a limited number of organic compounds such as dinitro phenols were starting to be used as selective chemicals for killing weeds. They were given the designation herbicides. The first of the highly potent systematic selective herbicides was developed initially as a material for potential use in biological warfare. Materials based on this new type of chemistry were introduced into agriculture at the end of the war as a major breakthrough in controlling the unwanted weed pests that had plagued agriculture for so long.

The chemicals were known as phenoxy herbicides, with the one most widely used in the United States designated as 2,4-D. In Europe and other parts of the world a closely related compound, MCPA, found wide use. This class of highly potent weed killers is still the most widely used and most economical of chemicals available for weed control. During 1968 it was estimated that the world expenditure for this type of herbicide was in excess of \$250 million.

This type of chemical is utilized as the standard weed control practice in a relatively large portion of the world's cereal crop acreage with major use also in corn, pastures, for control of woody plants on rangelands and for selective forest management. Such materials are also used to control certain sensitive perennial weeds that handicap agricultural production.

### Estimated 1968 World Consumption of Herbicides

In Millions of Dollars at Consumer Level\*

Area	Consumption
North America	\$550
Japan	70
Latin America	80
Near East, Southeast Asia and Oceania	80
Western Europe	60
Africa	40
Total	\$880

\* Based on figures compiled by the International Plant Protection Center, Oregon State University, from industry, agricultural agency and commerce agency sources.

Before the introduction of new compounds which could selectively kill most of the broad-leaf weeds, there had been little serious attention paid to the amount of damage weeds caused to crop production. These new chemicals, with almost magical capability of selectively killing a wide range of unwanted plants without harming the crop plants, opened a new era of intensive research in the universities and industries of North America and Europe.

#### Highly Selective Herbicides

Research demonstrated that weeds were much more damaging to crop production than had previously been generally assumed. Research also led to the discovery of an array of new, highly efficient, selective weed killers that could control not only the broadleaf weeds but also a wide range of weeds of all types.

During the past 15 years, more than 100 new organic herbicides have been introduced on the market. They are doing a broad variety of jobs. For instance, some are used to kill all of the vegetation along railroads, highway shoulders, and around industrial sites to eliminate the fire hazard and other undesirable properties of unwanted vegetation. Many have an unbelievable selectivity that will essentially remove all of the different kinds of weeds in a field without harming crops.

Their use in economically producing a weed free environment in various world crops takes on added importance as rapid urbanization in most areas of the world continues to create serious labor shortages on the farm. In many cases, mechanization of agriculture cannot occur until weeds are controlled with chemicals or highly effective machinery.

As long as a large amount of labor must be maintained on the farm in order to rid the crops of unwanted weeds, it is uneconomical to



*Dr. William R. Furtick explains herbicide test results to a group of chemical industry technicians.*

use mechanical harvesting equipment which eliminates the need for harvest labor. A good example of this interrelationship is the wide-scale use of the mechanical cotton picker in the United States. It was not economical until herbicides could be used to mechanize the control of weeds and eliminate the need for large hoe crews in the cotton industry.

#### Essential for High Yielding Crops

Chemicals for weed control are almost essential for obtaining the full productive capability of new crop varieties such as high yielding rice and wheat and hybrid corn. These new crops must be coupled with greater quantities of fertilizer and, in many cases, irrigation to reach their yield potential.

Where large numbers of weeds are left uncontrolled, as has been true of most agricultural areas of the world, the additional fertilizer and water are used by the weeds, too, and the crop cannot express the yield potential that has been bred into the new variety. This may be seen now in many areas of the world where weed control chemicals have not been introduced along with the new crop varieties and synthetic fertilizer. Yield responses do not reach expectations in many of the fields. Where herbicides, fertilizer, and new varieties are introduced as a package, almost unbelievable yield increases have frequently resulted.

The Oregon State-AID project has centered its initial activity in the northern region of South America with headquarters in Bogota, Colombia, under the direction of Dr. Juan Cardenas. Dr. Cardenas has worked with the research staffs of the Instituto Colombiana Agropecuaria (ICA) and the parallel organization Instituto Nacional de Investigaciones Agropecuarias (INIAP) in Ecuador.

The initial phases of the project were to train competent research personnel in these two organizations and establish research programs to determine what kinds of weed problems were most damaging to the principal crops of these two countries. Researchers were to assess the magnitude of losses under the current agriculture production practices and to institute research to develop new practices that would improve the efficiency for controlling the weeds in these crops. This project has been highly successful in its two years of operation.

### High Crop Losses

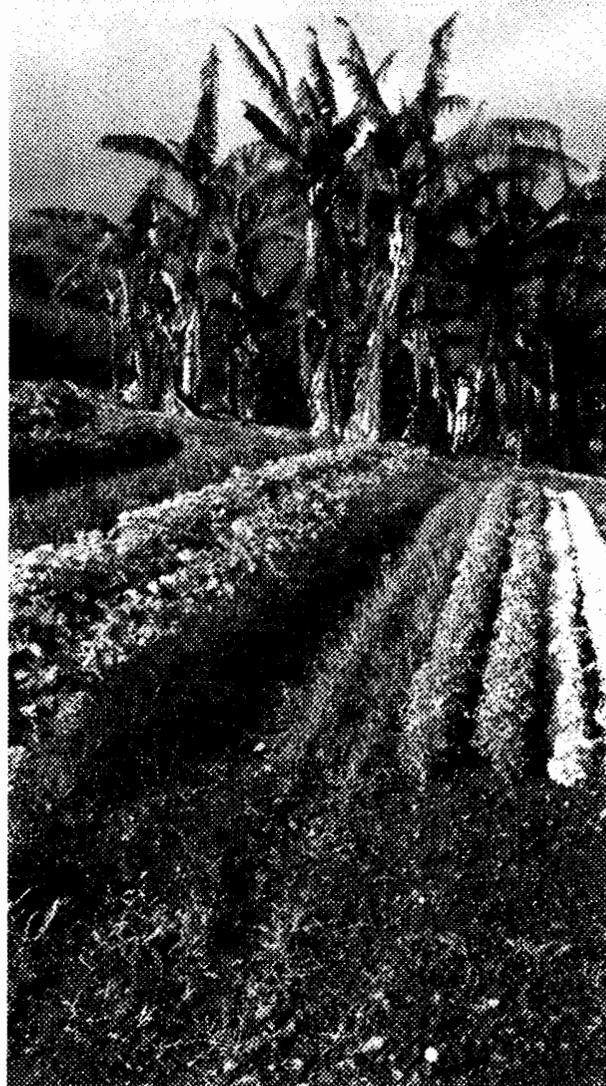
Surveys have been conducted to assess the impact of weeds on crop production in Colombia. It was found that in six of the main crops in the highlands, average loss due to weeds is 31 percent where no weed control was practiced. With commonly used and often inadequate weed control methods, losses are 10 to 15 percent.

In the semi-tropics and tropics, losses are more severe. In the Cauca Valley, taking average weed losses of seven crops, it was found that losses were 47 percent where no weed control was practiced. In the Tolima Valley where competition for moisture is more critical, average losses due to weeds were in the order of 71 percent for corn and rice when no weed control was practiced.

A conservative estimate of crop losses due to weeds in the Cauca Valley is 20 to 30 percent where current weed control practices are followed. In the Tolima Valley, the losses are estimated to be 30 to 40 percent under current weed control practices. On the Atlantic coast weed losses exceed 40 percent.

In addition to losses in the field, the cost of production is much higher than normal; in many instances being prohibitive.

Considering that the value of agricultural products was about 20 billion pesos for 1967 (\$1.2 billion), excluding coffee, and that losses due to weeds are in the order of 20 percent



Oregon State University scientists screen experimental herbicides in plots such as these in Hawaii.

(a conservative estimate), the country lost at least 4 billion pesos (\$240 million) in 1967 directly due to weeds under current methods of weed control. In addition, the cost of controlling weeds, primarily by manual means, is about \$150 million. This represents a total crop loss due to weeds of about \$400 million.

### Livestock Also Affected

Poisonous weeds in pastures are also taking a huge toll in livestock. A study by Ing. B. Gomez of the Banco Ganadero has shown that a single weed species, *Mascagnia concima* (*cansa viejo*) occurs in 1,050,000 hectares in an area near Barranquilla. Some 500,000 head of cattle graze in this area. The loss of cattle due to poisoning by this single weed species is approximately three percent or 15,000 head of



*South American farmers use various herbicides on selected crops in weed control trials.*

cattle. In addition, considerable weight losses occur in cattle which consume this weed but are not killed by it.

Losses due to weeds in other areas are also considerable although no estimates are available. Of major importance is their effect on large irrigation systems. Where these systems are in operation, the spreading of weeds, particularly of nutsedge, has been considerable. Aquatic weeds within the irrigation systems and in water reservoirs pose another major problem.

The development of effective new weed control practices for the various production regions of Colombia has been strengthened by the teamwork approach. Backup research has been conducted on a collaborative basis with agricultural chemical industries in the United

States, Europe and Japan through a new product and practices research effort under the auspices of Oregon State's International Plant Protection Center.

The Center has evaluated essentially all of the chemicals found biologically active by the research departments of approximately 60 of the world's chemical industries. This effort has been conducted in collaboration with the College of Tropical Agriculture in Hawaii. Several hundred of the most promising new chemicals have been studied to determine their potency on the primary weeds important in both tropical and temperate areas and their selectivity for important crops.

#### **Teamwork Approach Effective**

Those materials found promising were immediately utilized in the research programs in Colombia and Ecuador. This has led to the rapid development of new herbicide practices now becoming commercially utilized in Colombia. Many other practices are in an advanced state of development and promise to eliminate most of the large monetary losses to the agriculture of this region and substantially increase food production capability.

Efforts under this AID contract will now be directed toward determining the extent to which these new practices can be utilized in other production regions of the world. Initial efforts to determine their effectiveness will be undertaken in Central America and Southeast Asia.

The unusually high level of weed competition in the tropical regions where at present few herbicides are used points to the necessity for major emphasis on these new tools of weed control. They may be a key to vastly improving crop production when coupled with the right types of fertilizer and new improved varieties.

The work in Colombia and Ecuador demonstrates that most of the new herbicide practices developed for the temperate zone regions do not effectively solve the problems of most tropical conditions. It is therefore evident that major new research efforts will be necessary if herbicides are to be utilized to their highest efficiency in many of the world's agricultural regions.

The teamwork approach between industry, universities, and AID, exemplified by the Oregon State University contract, offers promise of speeding the development of a greater diversity of these new tools to improve world agriculture.



## ***Agricultural Development Strategy—*from p. 5**

ability to produce an end product or result that justified the effort.

The workshop took a close look at the role of institutional development in the recent agricultural successes without reaching any clear conclusions. Generally speaking, the experience to date has been too limited to identify or to measure the role of a particular institutional factor, i.e. education, credit facilities and the like. The available evidence precludes the assumption that building any particular set of institutions will automatically result in increased agricultural production. However, the existence of a rural infrastructure and essential institutions was one of the ingredients in every instance of marked expansion in agricultural output.

### **Institutional Components**

The "mix," or combination of elements, varied from country to country. For example, there was no indication that literacy or the level of farmer education was a significant factor contributing to successful results except that in some countries it seems to have been a factor explaining the concentration of participation among larger, more educated farmers. On the other hand, there appear to be some instances where marked successes have been achieved among relatively illiterate farmers by means of extension and information techniques tailored to their needs, i.e. use of demonstrations and observation of the practices of their successful neighbors.

There was agreement that to extend the "Green Revolution" to the less advantaged cultivators would require attention to essential institutional factors such as education and information, credit, extension and marketing designed to reach and to service the small cultivator. Increased emphasis on the role of private industry offers a means of reducing the burden on administrative structures.

Most major successes appear to have been closely associated with "campaigns" characterized by high level government support and mobilized effort. Very little use was made of sophisticated management systems and even where something of this type was used—e.g. Turkey and possibly Vietnam—the results do not seem to have been superior to those in other countries.

### **Future Implications**

What are the implications of experience with the high-yielding varieties for future developmental strategy? As already indicated, one conclusion of the workshop was that high-yielding varieties by themselves cannot assure sustained agricultural development revolution. A few basic points emerged as central to a successful agricultural development strategy:

a. The increasing need for wise government policy. The high-yielding varieties seemed to provide a providential means for escaping the ominous threat of famine and they were seized on eagerly, and utilized without much advance planning. The problems of the

future will require more careful study.

b. The need for a continuing flow of technological innovations, produced by research.

c. The need for stronger institutions, capable of reaching a larger segment of the rural population.

d. The need for an expanding body of trained manpower, on which effective policy planning, research and institutional operations will depend.

The workshop emphasized the continuing need for attention to research, particularly at the national levels, and to a "package approach" that assures that proper attention is given to critical components of development strategy. Continued growth in agriculture depends on a continuing flow of new technology which comes from adequate research.

The ability of scientists to manipulate the genetic structure of plants has been applied to problems of food production in the tropics and sub-tropics only in recent years. The success of the International Rice Research Institute in producing IR-8 within a five-year period demonstrates the remarkable breakthroughs which may be accomplished when competent interdisciplinary teams are mobilized to concentrate on the achievement of specifically defined objectives.

### **Research Objectives**

Although some progress has been made in widening the knowledge base and increasing the research capacity of the developing countries, the evidence is clear that for the foreseeable future the scientific structure in the LDCs is inadequate for sustained agricultural progress. Simultaneous action on two fronts is required:

1. The competence of the LDCs themselves, to carry on agricultural research must be progressively improved, and the ultimate objective must be to bring each country to the highest level appropriate to its size, resources and agricultural problems.

2. The deficiencies in scientific competence so common throughout the developing world must be compensated for, to the extent possible, by the importation of materials and skills. The mass of the world's scientific skills is now concentrated in the developed countries—in universities, research stations, foundations, the private sector, and these skills have not as yet been fully mobilized to provide both external assistance and to strengthen indigenous institutions and capabilities.

It is clear that there should be a significantly greater investment in research on problems of agricultural development in the LDCs, and on creating additional LDC capability to do research work. A larger share of AID's own funds should be invested in this area.

Land and water management, fertilizer and pesticide use were found to require special emphasis in developing agricultural strategy for the future. The new seeds should be referred to more accurately as high response varieties rather than high-yielding varieties since it is

only in combination with correct cultural practices, fertilizer and pesticide use and water management that their high-yielding potential can be realized. Additional research is needed on which to base recommendations to farmers in this regard.

At the same time the limited success already achieved has generated new sets of problems. Directly associated with expanded output is the need in most cases for more attention to marketing broadly defined and, in particular, to improvements in marketing and distribution facilities.

#### **New Problems Generated**

The very success achieved with the high-yielding varieties, particularly as production expands to the point where domestic needs for cereals are met, calls for some shifts in emphasis in agricultural development strategy. There are indications that the spectacular results achieved by high-yielding cereal varieties may be a factor tending to distort patterns of agricultural production and to emphasize cereal production at the expense of other crops such as legumes and pulses. These crops can make a major contribution to overcoming the protein deficiency generally prevalent in diets in developing countries. Nutritional needs should in fact be a major consideration in planning a strategy for agricultural development. Livestock and horticultural production likewise may merit high priority in the use of resources.

There is a need to keep investment policy under constant review. While the economic incentive to adopt innovations must be provided, and generally this means by government-guaranteed price supports, this should be carried out within a framework that assures that cost reducing technology is followed by lower prices.

Benefits from cost reducing technology will not be shared widely either by farmers or consumers if, as production expands in response to improved technology, prices are artificially maintained by government fiat. Such a practice discourages consumption and may result in the accumulation of stocks in government hands which the government may be tempted to move into export by the use of subsidies.

Generally speaking, governments have supported producer prices above world market levels in the countries that have achieved the most marked success in expanding production through use of new high-yielding seeds. While this may be an appropriate policy up to the point where a country becomes self sufficient in grain production, beyond that point there was general agreement that government price supports should be primarily for stabilization purposes, to minimize uncertainty regarding future market prices, thus eliminating or tempering one of the major risks a farm entrepreneur faces.

Allowing cost reducing technologies to be reflected in lower prices avoids problems which would otherwise arise. From the consumers' standpoint lower prices

encourage greater demand and increased consumption which, in itself, helps avoid market gluts.

There was general agreement that a development strategy for expanding food production must also give consideration to the effects on overall economic growth and the distribution of the benefits of technology among both farmers and consumers. Development strategy should assure that benefits in technological innovations are widely shared. Unless precautions are taken there is a danger of creating enclave agriculture, i.e. a situation developing in which the benefits to be derived from new technology are limited to an elite group of the better educated or larger farmers.

What should be the role of mechanization? AID policies have tended to support mechanization in some countries. Introduction of high-yielding varieties on larger farms tends to stimulate interest in mechanization as a means of getting farming operations done in a more timely fashion. The incentive is particularly great where two or more crops per year are possible.

Policies that encourage mechanization, however, risk limiting the benefits of technology to a few larger farms and by-passing the mass of cultivators. Given the chronic unemployment and underemployment that is prevalent in nearly all developing countries, policies that encourage mechanization and labor displacement by machinery appear highly questionable.

#### **Shared Benefits**

Even the high-yielding varieties are labor intensive, however. It is possible to evolve a strategy that seeks to extend the benefits of technology to small farms. This would require attention to labor and tenure policies, the development of institutions and infrastructure that facilitate the adoption of new technology by small cultivators, and greater emphasis on diversification. Social and economic development needs of most developing countries would appear to be better served by such policies than by policies that encourage the substitution of mechanization for human labor. The agricultural development pattern of the highly industrialized developed countries is not a model for the developing countries.

In conclusion, the workshop recognized that the development job clearly is and must remain primarily the job of the developing countries themselves. AID's job, with its limited resources, is to act as a catalyst, to assess development problems, to identify bottlenecks, and to use its limited resources to overcome these bottlenecks rather than to strive for an overall balance in the development components.

Above all, the workshop concluded that a developmental strategy must be location-specific. Strategy must be tailored to the specific needs of a particular country, with attention focused on identifiable bottlenecks. Finally, constant review and evaluation of development strategy is essential since successes by their very nature generate new sets of problems and new priorities.



# Conferences Focus on Nutrition

The importance of nutrition in achieving social and economic progress was emphasized in two May conferences sponsored by the Agency for International Development.

More than 100 delegates from 16 Latin American countries, United States governmental agencies, private industry, international and voluntary organizations met in Miami for the Sixth Conference of the Americas on Malnutrition as a Factor in Socio-Economic Development.

An In-Service Workshop on Nutrition held in Easton, Md., drew 69 AID and other U.S. Government employees from throughout the world to evaluate current programs and plan future policies for carrying on the War on Hunger in developing nations.

Dr. Martin J. Forman, Director of AID's Nutrition and Child Feeding Service, chaired both conferences.

## Conference of the Americas

In a telegram to the Miami delegates, President Richard Nixon said, "The urgent problems of feeding the world's growing population must have high priority. As nutrition experts, you can make a vital contribution through your deliberations and the programs that result. Your efforts give additional hope that by working together we may succeed in satisfying the most basic human need."

Keynote speaker for the conference was Dr. George Graham, Chairman of the Department of Pediatrics and Professor of Nutrition at Johns Hopkins University. Dr. Addeke Boerma, Director General of the Food and Agricultural Organization, gave a special address.

Principal speakers on the substantive themes of the conference were Latin Americans, and all of them emphasized the urgency of giving more attention to those factors which lead to better nutrition and health. Although they agreed some progress has been made, they repeatedly pointed out that the efforts in Latin America have barely kept pace with the increase in population. Per capita food availability is not increasing, and the mortality rate of infants and children under five remains staggeringly high.

Included among the resolutions of the conference were:

- Nutrition is indispensable to health and a primary factor in learning and productivity;
- Nutrition and food committees or other organizations should be established at high government levels;
- The development of agricultural technology and better systems of marketing should be emphasized as part of industrial development;
- Technical and professional schools should

strengthen their programs of nutrition and food education;

- Nutrition Information Centers should be created in each country;

- External food aid should be used in a manner that will stimulate local food production and economic development.

## In-Service Workshop

Lively panel discussions brought out the problems, experiences, plans, and hopes of U.S. government employees working in many of the developing nations. AID missions represented were India, Pakistan, Jordan, the Philippines, Thailand, Indonesia, Vietnam, Senegal, Tunisia, Nigeria, Ghana, Morocco, Brazil, Bolivia, Chile, Colombia, the Dominican Republic, Guatemala, Peru and Mexico.

Workshop participants concluded that nutrition and family planning programs can have a mutually reinforcing effect.

Many of the delegates felt that pre-school feeding programs, despite their high priority, have been limited by problems of distribution due to a lack of outlets. They called for new ways to make Food for Peace commodities available to pre-school children and mothers.

They agreed that school lunch programs, which provide an important part of the daily diet of many children, offer excellent opportunities for making children aware of the benefits of good nutrition through work in school vegetable gardens, use of nutrition education materials, and the example of well-balanced meals to create good food habits.

Participants suggested that grants and sales of Food for Peace commodities could be used to encourage the adoption of fortification procedures. For example, cereals shipped in whole grain form might carry a requirement that they be enriched and/or fortified when milled in the recipient country.

While calling for further tests of protein fortification of grains, the delegates also proposed that testing of fortification of food staples other than cereal grains (tea, salt, oils, etc.) should be encouraged.

They recommended that AID develop a protein foods incentive program for local food companies and provide technical assistance to local firms interested in developing new foods.

The importance of developing effective nutrition training programs at local and regional levels was emphasized, and the group also suggested that AID should establish a short course for Mission personnel who are working in nutrition and would be in a position to stimulate development of nutrition activities.

## On the Hill—from p. 3

comes will make it possible for the community to enter the market economy and support improved schools, health centers and transport facilities. This program will serve to expand popular participation in the development process so that Ethiopians may both make a greater contribution to and reap increased benefits from economic growth. . . .

One of the most promising recent developments is the impact of the "green revolution" in North Africa. Agricultural production in Morocco for 1968 increased by one-third over 1967. In Tunisia, although agricultural efforts are not as advanced, 1968 agricultural production was 15 percent above the previous year's output. Part of this increase is due to good weather conditions during the 1968 crop year, and there remain many obstacles to achieving sustained high yields. However, the introduction of new seed varieties, increased use of fertilizer and the availability of more credit undoubtedly made a significant contribution. This progress augurs well for achieving food self-sufficiency by the mid-1970s. . . .

**Robert H. Nooter, Acting Assistant Administrator for East Asia, AID:**

The race between food and people remains one of our foremost concerns. Here we can show some significant progress. In Indonesia, Korea and the Philippines, a major national goal is the achievement of self-sufficiency in food. We are helping these three countries and Laos to capitalize on the highly-promising new

rice varieties by providing technical assistance in cultivation methods and necessary additional resources such as fertilizers and pesticides. All of these countries have shown an upsurge in rice production. The Philippines achieved self-sufficiency in rice in 1968. For the area as a whole, both aid recipients and others, food production from 1964 through 1968 increased faster than population. The index of food production rose from 120 to 135 (1957-1959 = 100) during that period. In Indonesia and Thailand the increase was 8 and 11 points, respectively, in 1968 compared with 1967.

We are pleased with this growth but we realize that it is not the complete answer. The production of food is bound to encounter setbacks from natural and man-made causes but the demand for food continues to increase as populations grow and individual consumption rises in the wake of higher income. But even if hunger can be banished, and I believe that with enough intelligence and care it can be, the rapid rise of population, if unchecked, will thwart much of the economic and social benefits of hard-won economic growth. Where population growth is above two percent per year, too much of a country's economic growth is consumed by the new numbers to be fed, clothed, housed and educated, and the rest must work ever harder just to maintain existing levels of consumption, thus falling into what has been aptly called the treadmill economy.

## Quotes

"The links between ill health and underdevelopment are undeniable and important. Undernourished people cannot be asked to sacrifice for development; debilitated by dysentery, a man uses most of his energy just staying alive; incapacitated by tuberculosis, malaria, typhoid or leprosy he is a total liability to his community.

"One of our major efforts, therefore, has been to attack the diseases (and the causes of these diseases) which are responsible for putting large numbers of people out of commission, or weakening them . . .

"Another of our major pre-occupations has been to make the best use of our health programs to deal with the population explosion . . . Fear that children will not

survive has been and is one of the major motivating causes of high birth rates in the developing world . . . Increasingly it has become apparent that well-organized and staffed maternal and child health services are essential if the poor countries are to make headway against high birth rates."

C. Tyler Wood  
*Special Assistant to the  
AID Administrator  
at the AMA's 4th  
Conference on International Health  
May 23, 1969*

\* \* \*

"While scientific agriculture will greatly increase yields per unit of land and total production of food crops as well as animal protein sources, there is little likelihood that such increases will keep pace with the present rate of population rise.

"We must, therefore, look to unconventional sources of protein produced through the application of science and technology to supple-

ment those coming from conventional sources."

Dr. Nevin S. Scrimshaw  
*Head, Department of Nutrition  
and Food Science, M.I.T.  
May, 1969*

## In Print

### Recent Publications of Interest

*The International Developer: Agriculturist.* Published by the Agency for International Development, 1969, 16 pp. Available on request from Mr. Robert Hannon, Professional Talent Search, Agency for International Development, Washington, D.C. 20523.

This recently published recruitment brochure describes the role played by a wide variety of professional agriculturists in U.S. foreign assistance programs in developing

nations throughout the world. It discusses the challenges, the problems and the pleasures inherent in helping to wage war on worldwide hunger.

Technical specialties often needed in developing countries include: agricultural credit, economics, education, engineering and extension; agronomy and seed improvement; cooperative development; entomology and plant protection; fertilizer use; fisheries; food processing; forestry; horticulture; hydrology; irrigation and drainage; land use and development; livestock development; marketing and storage; nutrition; range management; research; rodent control; soils and water management, and vocational agricultural education.



## IN BRIEF

### Loans for Colombia

Agency for International Development loans totaling \$85 million will support the efforts of the Government of Colombia to improve agriculture and education and to accelerate economic and social development.

In the agricultural sector, a \$15 million loan will be used principally to finance imports of farm machinery, fertilizer, insecticides and other tools of agricultural production.

More than \$1 million of the agricultural loan will pay dollar costs of continuing the services of a University of Nebraska team which, for the past three years, has been working with the Colombian Institute of Animal Husbandry and the National University to improve the country's agricultural sciences through research, teaching and extension services.

Most of the \$10 million education loan will be used to finance imports from the U.S. All of the third loan, \$60 million, will be spent to bring in general U.S. com-

modities which have a high priority for Colombia's continued economic growth. The type of goods to be imported will be selected by mutual agreement between the two governments.

\* \* \*

### Agricultural Credit for Mexico

A \$65 million World Bank loan to Mexico is aimed at helping to promote a major increase in livestock and crop production. It will help support a \$200 million, five-year agricultural credit program administered through FONDO, a Banco de Mexico trust fund.

A major segment of the plan provides for \$90 million to be applied toward development of commer-

## FPC Wins A Prominent Fan

Mrs. Marjorie Merriweather Post, Washington society leader, member of a family prominent in food processing and patron of symphonic music, also has become an enthusiast for Fish Protein Concentrate.

In a letter to the Agency for International Development, Mrs. Post said of FPC:

"This is going to be a marvelous thing for people because there is so much nourishment in it. Too much of our food has been processed to the point where all the nourishing good is gone. As you know, I am sure, our family has been in the food business with cereals, etc. so I am keenly interested and find this all a very exciting new thing."

The letter climaxed this series of events:

• Mrs. Post read a magazine story about FPC and the significance of

cial cattle ranches in the tropical southeast in a 30 million acre area bordering the Gulf of Mexico.

\* \* \*

### Do-It-Yourself Fertilizer Plant

A report on essential steps in building an ammonia fertilizer complex was recently published by the United Nations Industrial Development Organization as a guide to developing nations.

The report is the second in a series of monographs designed to provide the most recent technical and economic information in the fertilizer field as a means of helping to increase agricultural production quickly and efficiently.

this high-protein blend in the War on Hunger. It aroused her interest and her secretary inquired of the editor how she could secure some.

• The editor passed on the request to AID, whence the story had originated, and a cup of FPC was speedily delivered to Mrs. Post's home, renowned "Hillwood" in Washington.

• Mrs. Post wrote to the Office of the War on Hunger Reports and Information Staff that "we promptly made up some cookies, including some of this concentrate, and yesterday and today I have been enjoying them and they are perfectly delicious."

The Reports and Information Staff then asked Mrs. Post if she would consent to furnishing War on Hunger the recipe. She would—and did. Here it is:

### MRS. MERRIWEATHER POST'S RECIPE FOR COOKIES MADE WITH FPC

#### Ingredients:

½ cup margarine  
¼ cup sugar  
1 egg  
1 tsp. baking powder  
1 cup flour (remove 1 tblsp. of flour from the 1 cup)  
1 tblsp. FPC (add to the flour to replace the 1 tblsp. of flour)

Cream the margarine and sugar. Cream egg into the mixture. Mix together the dry ingredients. Add dry ingredients to creamed ingredients to form batter. Drop batter on cookie sheet—½ tblsp. for each cookie. Bake at 350 degrees for 8-10 minutes.



# Universities Win AID Grants

*Dr. Erven J. Long, Director of AID's Research and Institutional Grants Staff, speaks at a news conference announcing the AID grant for the new marine resources center at the University of Rhode Island. Also, left to right, are Dr. Werner A. Baum, President of the University; Sen. Claiborne Pell (D-R.I.); Dr. John A. Knauss, University Provost for Marine Affairs; and Rep. Robert O. Tiernan (D-R.I.).*



With help from the Agency for International Development, five more U.S. universities are strengthening their ability to assist developing countries in the War on Hunger.

Grants totaling \$4.1 million were awarded this spring to the Universities of Rhode Island, Wisconsin, Arizona, Colorado State and Utah State to build up their competence in such areas as salt water fisheries, land tenure and water resources. Fifteen universities are now receiving such AID support.

## Water Resources

The three western universities received five-year grants totaling \$1,850,000 to help them expand their water resources programs.

"The proper development of water resources is a major need in many countries where agricultural production must continue to increase," said Dr. John A. Hannah, AID Administrator. "These grants will help expand the knowledge and improve the skills necessary to help bring about increases in food output."

Colorado State University, which received a \$750,000 grant, will emphasize water delivery and removal systems and relevant institutional development. Utah State University, with \$750,000, will specialize in on-farm water management, and the University of Arizona, with \$350,000, will concentrate on watershed management.

The University of Rhode Island received a \$750,000 grant to establish the nation's first international center designed to help developing countries utilize food and other resources from the sea.

The Center is expected to focus initially on the problems of developing fishery resources. It will train foreign students and U.S. professionals and will supply technical consultants for overseas assignments.

## Land Tenure

A \$1.5 million grant will enable the University of Wisconsin's Land Tenure Center to expand its capa-

bility for providing developing nations with assistance in land tenure and agrarian reform.

Over the past seven years, with support from AID, the Center has been engaged in studying Latin American land tenure problems. The new grant will allow the Center to add Asian and African countries to its training and research activities.

With the five-year grant, the Center will be able to enlarge its professional staff, develop and restructure courses, increase its library and information services, provide training to professionals and broaden the scope of its research.

## Previous Grants

Similar AID grants have been previously awarded in the high-priority areas of agriculture, food production, rural development, population studies and family planning.

AID Administrator Hannah remarked, "These long-term grants represent an important type of technical assistance the United States must use in its aid programs. We intend to draw upon the resources of our universities and other institutions for special help in important development areas. The dividends from these investments are bound to be far-reaching and long-lasting."

Six universities, comprising a consortium to assist in the rural development of India, have received grants for studies in food and agriculture. They are Illinois, Ohio State, Kansas State, Tennessee, Pennsylvania State and Missouri.

Grants for studies in population and family planning have been awarded to the University of North Carolina, Johns Hopkins University, and the University of Michigan. Tufts University has received funds to develop competence in promoting participation in democratic processes.

According to Dr. Erven J. Long, Director of AID's Research and Institutional Grants Staff, the funds are used "to build resources in depth rather than to procure services for AID for specific limited purposes."



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Agency for International Development  
Office of The War on Hunger  
Washington, D. C. 20523



Philippine researcher uses directional antenna and portable receiver to study rats carrying tiny radio transmitters. (See p. 9.)