

War on Hunger

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A Report from The Agency for International Development



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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.

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Readers are invited to submit news items, original manuscripts (including speeches) and photos on any aspect of the War on Hunger. Contents of this publication may be reprinted or excerpted freely.

'In the shape of a Loaf of Bread'

by Roger Revelle

Throughout the last 6,000 years most human beings everywhere have lived in deprivation, ignorance, and misery—not unlike that of India or Africa today. The present situation of the peoples of the West is a highly anomalous departure from the normal human condition. It remains to be seen whether it will prove to be an ephemeral perturbation or a transition to a new level of human fulfillment, a true Age of Man.

It seems certain, however, that such a new age cannot arise unless all human beings march forward together. The existing gulf between peoples, the gulf between affluence and poverty, is more than a scandal and a tragedy; it is also something that cannot persist. The gulf is bound some day to close. The question is whether it will be closed by a vast improvement in the lot of the poor or by a decline and degradation of the West.

Most past experience would suggest that the Western civilization will decline as all others have done in the past. But we are in possession of something that has never existed before, something quite extraordinary—the method and the spirit of science and the capacity to organize and utilize the results of science, not only to gain understanding of the world and of ourselves, but to change the human condition.

In the rich countries, the scientific and technological revolutions have created self-generating economic growth. The chief result of these revolutions in the poor countries has been to multiply misery, by causing an increase in human numbers at rates never before experienced. The question then arises: Is it possible at this late date for the peoples of the poor countries to gain the benefits of science and technology, and thereby to attain lives of hope and human dignity? We must ask ourselves whether, to what extent, and in what way science and its companion, technology, can be used to transform the lives of the peoples of the poor countries, and ultimately to close, at least partially and relatively, the gap that now divides the world.

The real obstacles to development are technical, social, economic, and moral—the Four Horsemen of the Modern Apocalypse are Ignorance, Hatred, Fear, and Indifference. Availability of natural resources is not a fundamental difficulty. Cheap and abundant nuclear

power could, in principle, be installed everywhere within the next several decades, and other natural resources are widely distributed. Agricultural yields could be increased several fold throughout most of the underdeveloped world.

1,000 Calories per Person

Within the United States we produce some 11,000 calories of edible crops per person per day on one acre of cultivated land per person. Of this, we eat about 2,000 calories, export another 2,000, and feed 7,000 to livestock and poultry, from which we obtain the remaining thousand calories in our average daily diets.

If the productivity of the world's presently cultivated 3.3 billion acres could be raised to equal that of the United States, the six to seven billion people anticipated in the year 2000 could obtain pleasantly adequate diets in terms of calories, proteins, and other nutrients, even though their supply of animal products would be only half that of the average U. S. citizen today. Such an increase in productivity would not be inhibited by climatic or soil conditions in the poor countries. With full irrigation development, it would be possible to grow three crops a year over much of their cultivated land areas, while in the United States cold winter weather severely limits multiple cropping. The problem of increasing farm productivity in the poor countries is essentially one of creating radical changes in agricultural technology. This involves much more than agricultural science as it is usually defined, but such science is an essential component.

For the longer term there are abundant reserves of potentially arable but uncultivated lands in the poor countries of Africa and South America. The picture is much less optimistic for Asia, where most of the world's people live and populations are rapidly increasing. With full irrigation development and multiple cropping wherever feasible, the gross cultivated area (cultivated area times number of crops per year) in Asia, outside the Soviet Union, could be increased to about 2.5 billion acres. At present United States levels of technology, and taking into account the cultivated area necessary for non-food crops, it would be possible to produce

4,500 calories per person per day for foodstuffs and livestock feed for five billion people. This is only 20 percent more than the population expected by the end of this century. At present levels of productivity per acre, the potential gross cropped area would provide no more than a bare subsistence diet for the population expected by about 1990.

This discussion of the physical potentialities for increasing agricultural production raises implicitly some of the reasons why the poor countries are not now receiving much benefit from science and technology. These driving forces of the Western world cannot be effective in the poor countries unless they are accompanied by capital investment, social change, educational expansion, and governmental reform.

Market Agriculture

The traditional method of increasing food supplies by expanding subsistence agriculture is no longer feasible, particularly in Asia, where most of the world's people are, and where nearly all the arable land is already cultivated. To achieve increased yields per acre, the farmers must purchase fertilizer, irrigation water, pesticides, improved seeds, farm tools and farm machinery, and they will be unable to do this unless they can sell a large share of their crops, that is, unless they can make the transition from subsistence agriculture to market agriculture. This means that agricultural production cannot be increased sufficiently unless there is also a very considerable overall economic development, at a rate markedly in excess of the growth in population. Economic development, in turn, means rising per capita incomes, and hence an increase in per capita demand for food.

Increased inputs help the new IR-8 rice to reach its full high-yield potential. Here, Philippine President Ferdinand Marcos and Wesley C. Haraldson, director of U. S. AID Mission in the Philippines, inspect sample kit for introducing new methods.

The needed increase of food supplies, because it involves overall economic development, will involve very large capital investments, probably a transfer of five to ten billion dollars more per year from the rich countries to the poor ones than is now the case, as well as a very high level of technical assistance in research, experimentation, education, and expert advice.

The developing countries lack the research and educational institutions and the educational manpower that are necessary for the sustained application and creation of agricultural technology. There are not enough trained persons in those countries to teach the numbers of scientists, extension workers, and other specialists who will be needed. It will be mandatory to add to their human resources the very large resources of the United States land-grant colleges, private foundations, and industry, and the expertise of the Europeans and the Japanese.

Some education, particularly of new faculty members, can be given in the advanced countries, but most should be in the less developed countries, with their unique conditions and special problems. This will require institution building on a very large scale.

Education for modern agriculture means much more than teaching agronomy and animal husbandry. It involves engineering, economics, sociology, law, the humanities, and all the sciences. Most of the fields of human endeavor must be focused on agricultural development. Merchants, bankers, and administrators are needed to provide facilities; legislators and civil servants to establish effective laws and regulations; editors and broadcasters to mold public opinion and transmit information to the farmers. In these overwhelmingly rural societies, agricultural development is not just a matter for farmers and agricultural technicians, but depends on the whole way of living, the culture and values of the nation.

Obstacles to Development

These statements hold doubly true for the problem of overall economic and social development. Capital investment and technology are necessary but not sufficient conditions. Numerous obstacles must be overcome: the indifference of civil servants, and the self-seeking of oligarchs; the shortage of entrepreneurs, the lack of rewards for scientists and teachers, the emphasis on family rather than public morality, the fear that innovations will make an already bad situation worse, the small rewards for the individual in an extended family, the reliance on magic rather than experiment, the tendency to seek security rather than improvement.

The barriers of history, tradition, and culture in the poor countries are so great that many laymen, and even many social scientists and professional humanists, have seriously questioned whether our Western culture has much to offer them. What do these people want? What would a better life mean for them? We talk glibly about the spirituality, other-worldliness and apathy of the Indians as a justification for our failure to help in alleviat-

(Continued on page 14)





Seven New Concepts in Agriculture

by Sterling Wortman

Director, Agricultural Sciences
The Rockefeller Foundation

Editor's Note: Over the years we have learned much—sometimes painfully—about food production, and we need to know still more. Of particular interest are these seven concepts from one who has been intimately involved.

Dr. Wortman's point of view is that of the agronomist, as is implicit throughout his remarks, and his concepts do not dispute the teachings of other disciplines. Thus, his assertion that greater literacy is not a prerequisite to economic development is "intended in no way to minimize the importance of a nation's investment in education," but rather to make clear that agricultural development need not await that process.

Similarly, to say that land reform is not a prerequisite to increased agricultural production in no way denies the desirability of land reform; it merely notes that effective steps to increase crop production can be taken even before social and economic reforms are carried out.

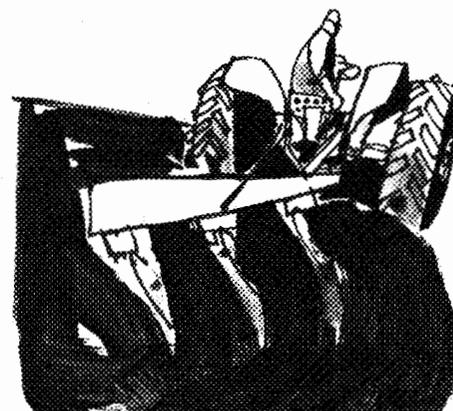
The seven concepts are excerpted from a paper presented by Dr. Wortman in Columbus, Ohio, November 14, 1967.



1. *Farmers will adopt profitable practices.* There have been many unsuccessful efforts in the past to induce farmers to accept individual new practices, or supposedly better practices of their neighbors. Consequently it often has been assumed that agriculture cannot progress until the farmers have a substantially better basic education or change certain attitudes. Experience now indicates rather clearly that even the poorly educated small farmer will adopt new practices rather rapidly if (a) the new sets of practices are clearly more productive and more profitable to him, (b) an experienced agriculturist will show him how to use them, (c) governments will make available to him, on credit when needed, fertilizers, pesticides, and other essentials and (d) there is an available market and a satisfactory price. The major blame for static yields can no longer be placed entirely on the farmer.

2. *Government leaders can stimulate agricultural development.* It has become fashionable in recent years to malign national authorities in the developing countries for their

apathy toward agricultural improvement. We have heard repeatedly that such leaders are not making the necessary investments of men and money in agricultural activities, that agricultural institutions are not receiving adequate support, that policies are discriminatory against agriculture. There has indeed been too much apathy, but it has been most encouraging to see the speed and vigor with which leaders in the Philippines, in Pakistan, in India, in Turkey have supported agricultural efforts, and we must re-examine the basis for the criticism.



When we take into consideration the fact that national leaders abroad have for the past two decades watched unsuccessful attempt after unsuccessful attempt to improve agriculture through community development efforts, through reorganized extension programs, through introduction of piecemeal technology, then perhaps it is understandable that apathy prevails. But, it is also encouraging that some governments

do promote agriculture once the leaders see for themselves on the lands of their own farmers that new and useful technology will bring more profits to their farmers and more income to their nations, and that their own trained people can be instrumental in bringing these benefits to their countries.

3. *Greater literacy is not a prerequisite to economic development.* Some influential persons, in the U.S. and abroad, have believed that agricultural progress can occur only as substantial improvement is made in the literacy of the farmers. It therefore has been concluded that, to accelerate agricultural progress, nations must first invest in primary and secondary education. Recent events in Mexico, India, Pakistan, Kenya and El Salvador indicate that such education is not a *prerequisite*, but that effective production efforts can be mounted without waiting for these long-term educational developments. This is intended in no way to minimize the importance of a nation's investment in education, for we all realize that such education is highly important. But it is also costly. Most developing nations must, if they are to adequately support education, first create the wealth to supply the necessary funds. In nations with rural economies this is largely a job for the professionals in agriculture.

4. *Increased per capita income is not a prerequisite to progress.* Some studies have been interpreted to indicate that agricultural output can be rapidly accelerated only when a nation reaches some "take-off" stage in level of per capita income or capital accumulation. Interestingly, some of the most rapid progress being made today is in nations which have not met these supposed requirements. Rather, it is becoming increasingly appreciated that per capita incomes climb as a *result* of agricultural and other economic progress.

5. *Acceleration of agricultural output can be rapid.* Experience in Mexico, in Pakistan, in Kenya, and

elsewhere indicates clearly that agricultural productivity can be accelerated at rates never before experienced—even in the United States. This is not to imply that the United States has not been capable of such rapid increases; rather it suggests that given the need and the determination, a nation can by concerted action bring about accelerated economic development through agriculture, and at rates commonly considered impossible of attainment less than a decade ago.

6. *Land reform is not a prerequisite to accelerated production.* In some nations such as Japan, Taiwan and Mexico, rapid agricultural progress has been associated with land reform and undoubtedly it sometimes has been a factor of some importance. A nation should put its land to most productive use, large under-utilized land holdings should be in economic production, farm holdings must be economic units and should not be excessively fragmented, and landlord-tenant relationships must permit the man who tills the soil to have a profit incentive. And, it is now obvious that farmers must have a profit incentive if they are to invest added time and money to obtain higher productivity. Nevertheless, some nations are not waiting for politically sensitive land reform programs to mature; they are mounting crop production campaigns now.

7. *Agriculture is a basic industry.* There is an increasing awareness that agriculture is a basic industry in all nations except a few highly industrialized and urbanized ones. This has led to the realization that the total economic development of each nation, including its ability to finance needed public programs, depends upon greater output per unit area and increased profitability of agriculture. In the nations having predominantly rural populations, farm income must go up. Agriculture must be moved from a barter system to that which will provide

greater *per capita* income to spur the demand for products of industry.

In each nation relatively few major crop and animal species account for most of the wealth which is, or could be, produced. Certain of these are the commodities which first should go up in productivity. The shipment of food into the deficit countries, either as raw products or as manufactured or processed substitutes, is not a good alternative to production by the recipient nation if it depresses farm prices and discourages production. Economic development, then, hinges rather directly on improvements in conventional agriculture, largely through the conventional means so well known in the United States and in other advanced countries.

The seven new concepts discussed above will, in turn, facilitate and make more effective the necessary steps toward improving conventional agriculture, and thus fostering economic development.



James Named to Head AID War on Hunger

President Johnson has nominated Dr. Herman Brooks James to be Assistant Administrator for the War on Hunger, Agency for International Development.

Dr. James is Professor and Dean of Agriculture at North Carolina State University, where he has been a faculty member since 1945. He is also a member of the Advisory Committee on Agricultural Economics of the Department of Agriculture.

For many years Dr. James has maintained a special interest in agricultural development problems in Latin America.





Ayo Abifarin, AID participant and graduate student at Purdue University, crosses promising grain sorghum selections.

AID Project Improves Quality, Yield of Sorghum

New high-yielding, high-protein varieties of sorghum, developed at Purdue University in research sponsored by the Agency for International Development, can materially improve the diets of millions of persons in Africa and Asia, where grain sorghum is an important food.

This report by Dr. Robert Pickett, Professor of Agronomy at Purdue and principal investigator on the AID-Purdue University research project, was made at a recent seminar in Washington, attended by AID and Department of Agriculture scientists.

In addition to their importance as human food, the new grain sorghum varieties will improve livestock feeds around the world, Dr. Pickett said.

Grain yields of over 200 bushels per acre can be anticipated in the developing countries with the new varieties under favorable conditions, Dr. Pickett said. Selected hybrids are capable of much higher yields, but may not be practical in countries which do not yet have a seed industry to produce hybrid seed.

Protein levels in the new grain sorghums range from 15 to 20 percent, compared with 10 to 12 percent for ordinary sorghum. This sharp increase will make available tremendous amounts of scarce protein, thus enhancing the nutrient quality of this major cereal food. Low protein levels in the diet of the sorghum-eating peoples have resulted in malnutrition and in irreparable losses in learning capacity of infants.

Dr. Pickett and his team have determined that some sorghum varieties have high levels of the essential amino acids, lysine and threonine. The Purdue investigators found that both of these characteristics—high

quantity as well as high quality of protein—are inheritable, and they are building these characteristics into high-yielding varieties adaptable to conditions in the less developed countries. Dr. Pickett is convinced that high-yielding, high-protein grain sorghums can be developed to meet the specific needs and food preferences in each country where sorghum can be grown.

Dr. Pickett's interest in the potential for expanded utilization of sorghum was aroused when he spent a sabbatical leave in India with the Rockefeller Foundation. In India Dr. Pickett worked on more than 12,000 items in the world sorghum collection, which consists of samples of sorghum from all parts of the world. The collection was assembled by the Rockefeller Foundation in cooperation with the Indian Government.

After returning to Purdue Dr. Pickett continued his work on materials from the world collection, and found that some had doubled the protein content of varieties commonly grown. These findings, together with Dr. Pickett's observations on sorghum yield potentials, resulted in the research contract between Purdue University and AID.

The project's aim is to investigate the possibility of improving yields and nutritive quality of the grain sorghums. Dr. Pickett is identifying high-yielding and high-protein germ plasm materials from the world sorghum collection, and developing them into commercially acceptable varieties which can be adapted to meet specific needs of the developing countries.

—Alvin D. Ayers

AID to Help BRAZIL Fight Malaria

The Agency for International Development has authorized a \$10.5 million Alliance for Progress loan to the Government of Brazil to help finance commodities and technical assistance needed to continue the malaria program.

Brazil's goal is eradication of malaria in areas inhabited by 45 million people—52 percent of its population—by the end of 1968, and protection from the disease, through spraying, in the rest of the nation by the same date.

In addition to technical assistance, the AID loan will finance the import of needed American goods including DDT, triton, microscopes, microslides, laboratory supplies and sprayers.

Malaria eradication in Brazil to date, 1958-68, has cost an estimated \$106 million of which the U.S. has contributed approximately \$14 million in grants and \$6.5 million in a loan.

The present program will continue through 1975 and will cost an estimated \$216 million for the 17-year period. The Brazilian Government will finance 81.1 percent (\$175 million) in local costs and external sources will provide 18.9 percent (\$41 million) in imported commodities and technical assistance.

Reported malaria cases have been averaging 100,000 annually, but health experts believe the actual number is higher because many cases go undetected or unreported.

Already there are malaria-free areas as a result of the continuing program. These include Rio de Janeiro, Sao Paulo and some of the more populous sections of the country such as Rio Grande do Sul and substantial portions of the states of Bahia, Pernambuco, Minas Gerais, Ceara, Paraiba, Rio Grande do Norte and Santa Catarina.

Of Brazil's 87 million inhabitants, 70 million now live in areas under the federal malaria eradication program. The Brazilian Government, with the assistance of the Rockefeller Foundation, first organized its anti-malaria service in 1938 following a severe epidemic in rural areas of the states of Rio Grande do Norte and Ceara, spread by the anopheles gambiae mosquito.

After two years the anopheles gambiae was eradicated there but that disease continued to be spread by other malaria-carrying species. In 1941 a National Malaria Service was established and in 1943 control was extended to the Amazon and Doce River Valleys. The control activities consisted of draining and filling the principal breeding places.

Brazilian efforts have been coordinated with U.S. and international health agencies. In 1964 the U.S. loaned Brazil \$6.5 million to acquire U.S. supplies. In 1968 the Pan American Health Organization and the U.S. Public Health Service assisted the Brazilian Ministry of Public Health in drawing up a national plan for eradication of malaria.

Current plans call for spraying 4,044,000 homes during July through December to bring the year's total of protected homes to 7,346,000. A PAHO staff of 18 experts is assisting and AID is financing services of five malaria technicians from the U.S. Public Health Service.

The program will be carried out under Brazil's Ministry of Health through its Malaria Eradication Program (CEM). The Pan American Health Organization is providing technical support and anti-malarial drugs.

2 CONFERENCES STRESS REGIONAL COOPERATION AGAINST MALNUTRITION

Two important regional conferences on nutrition were held in March—a CENTO Regional Nutrition Conference in Islamabad, Pakistan, March 18-22, and a West African Nutrition Conference in Dakar, Senegal, March 25-29. The importance of regional cooperation in combatting malnutrition was stressed at both meetings.

The Dakar Conference, sponsored jointly by the Republic of Senegal and the Agency for International Development for the United States, was attended by representatives from Gambia, Ghana, Liberia, Nigeria, Sierra Leone, Ivory Coast, Dahomey, Guinea, Upper Volta, Mali, Niger, and Togo, in addition to the two sponsoring countries.

Dr. Martin J. Forman, Director of the Nutrition and Child Feeding Service, Office of the War on Hunger, headed the AID delegation, which included Mrs. Frank Pinder and Joyce Mallinger. Dr. Jacques May, U.S. Public Health Service, was the Conference Convener. Pre-Conference arrangements were made by James Maher, regional Food for Peace Officer, AID.

The conference participants — government officials dealing with nutrition, and professional leaders involved in nutrition and food technology—adopted recommendations covering these points:

1. The need for regional training centers;
2. An exchange of manuals, recipes and educational materials;

(Continued on page 14)

Peace Corps Enlists In War on Hunger

Meat and potatoes are taken for granted by most American families. But in India, where the fight to halt hunger faces a most gruelling test, meat is taboo because of religious values and potatoes are far from plentiful.

Little wonder, then, that two Peace Corps Volunteers take great pride from the seemingly insignificant achievement of helping an obscure village in northern India double its potato production.

David A. Copus, 26, of Dallas, Texas, and Gene Tackett, 24, of McFarland, California, are food production Volunteers in Village Susundi, Ghazipur District, in the Indian state of Uttar Pradesh.

The two Volunteers have been living among the Koeri people for almost 18 months. Their village is one of 112,315 villages in Uttar Pradesh, a state which has a population of 80 million.

Village Susundi, with less than 1,500 inhabitants, is located in a traditional potato-growing region of India. But there has been a high incidence of disease in locally-grown potatoes, the Volunteers reports.

Neither Volunteer had worked on a farm before joining the Peace Corps. Copus has a bachelor's degree from Northwestern University and a law degree from Harvard. Tackett attended the University of California at Santa Barbara. They received their training for the India assignment in a crash eight-week course at the State University of New York in Albany.

Copus and Tackett read about a new variety of red potato in an Indian agricultural publication. They informed the villagers about the new potato and urged them to experiment.

Through the efforts of the Indian government's regional botanist, L. C. Sikka, the Volunteers were able to obtain enough seed for demonstration purposes. Other officials, impressed by the effort, helped provide ample fertilizer.

"The results are impossible to believe," says Copus. "The new potatoes have broader leaves and are growing more rapidly. They are 100 per cent disease free. The yield should be double, if not triple, the normal harvest."

Even more significant, says Copus, is that "from a meager beginning of two acres of demonstration plots in 1967, we will leap to perhaps 100 acres in 1968."

Task Has Only Started

But the Volunteers feel their job is only beginning. "Farmers are coming from miles around asking us for seed for next year. Therefore, we are planning to form a village committee which will elect a representative to make the necessary arrangements for purchasing new seed," explains Copus.

But the most important factor, according to the Volunteers, is that the farmers are convinced they need to be receptive to new varieties of seed and new cultivation practices.

"We hope that in two years Ghazipur District will be saturated with the new potato," says Copus "and we also hope that the farmers will continue to ask the all important question: How can we improve what we are presently doing?"

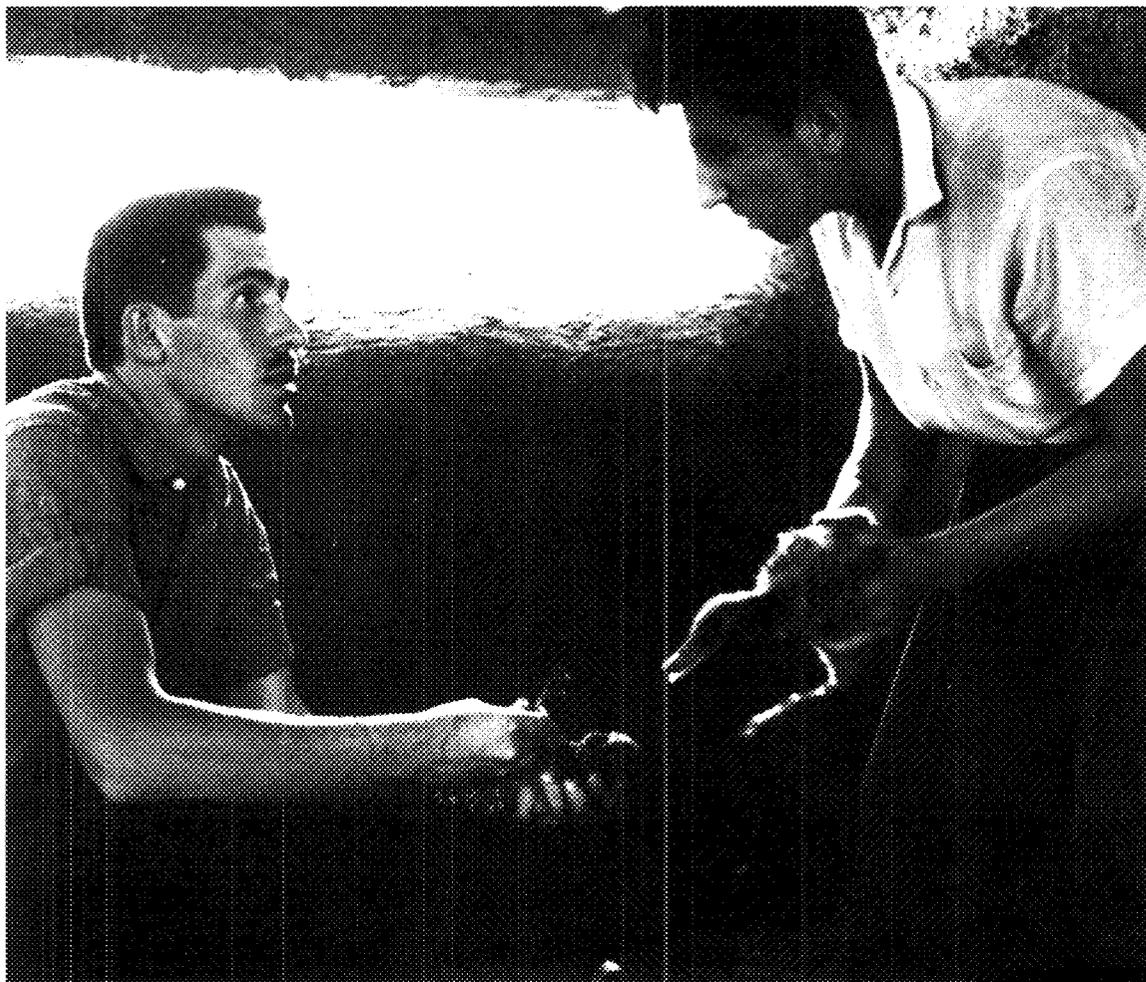
The Volunteers say the farmers have been asking this question for some time.

Volunteer William C. Dahnke (center), a Ph.D. in soil chemistry, teaches in El Salvador's agricultural college. He is seen here with two of his students.



Volunteer Herb Johnson (right), who teaches agricultural techniques at an experimental farm station in Iran, is seen doing field work with a student.





Farmers in Kouchesfahan, Iran, had never raised ducks until Volunteer Dennis Yates (left) persuaded them to start a project that has proved to be extremely profitable.

"Only the answer has been lacking," says Copus. "Somehow expert knowledge is not reaching the villagers. We are bringing that to them."

Finding the answers to various aspects of the world's food problem is a steadily increasing concern of the Peace Corps. Copus and Tackett are two of more than 3,350 Volunteers who are involved in agricultural or agriculture-related programs in 34 of the 57 nations where the Peace Corps operates.

This number—25 percent of the entire contingent—represents a substantial increase in size and scope of Peace Corps involvement in agriculture in the past few years. According to current plans, by 1970 half of all Peace Corps Volunteers will be working in agriculture.

Help Teach Management Techniques

Basically, Volunteers work through cooperatives to help host country nations improve not only farming techniques with particular staple food crops, but cooperative management techniques as well. Volunteers find out quickly that while good management is a key to a successful cooperative, persons with proper training usually are not available in most countries.

Under these circumstances with individual farm groups and rural leaders trying to meet community needs.

Putting this into practice in the African nation of Niger, Volunteers coordinate their efforts with the Centre de Cooperation, an Agricultural Economy.

About 30 Volunteers act as a link between farmers and a national agency. They also help with cooperative stores, arranging for the sale of crops and teaching farmers, including how to weigh produce.

In Bolivia, more than 100 rural agricultural advisors help farmers' unions attain self-sufficiency through classes for members, improved farming techniques, developing sound agricultural procedures, assisting the extension workers in training new leaders.

There also are many other agricultural programs which include such as animal husbandry, irrigation, mechanics, forestry and fish



At feeding time in an Indian poultry cooperative, Zumbro (right) takes care of the chores.

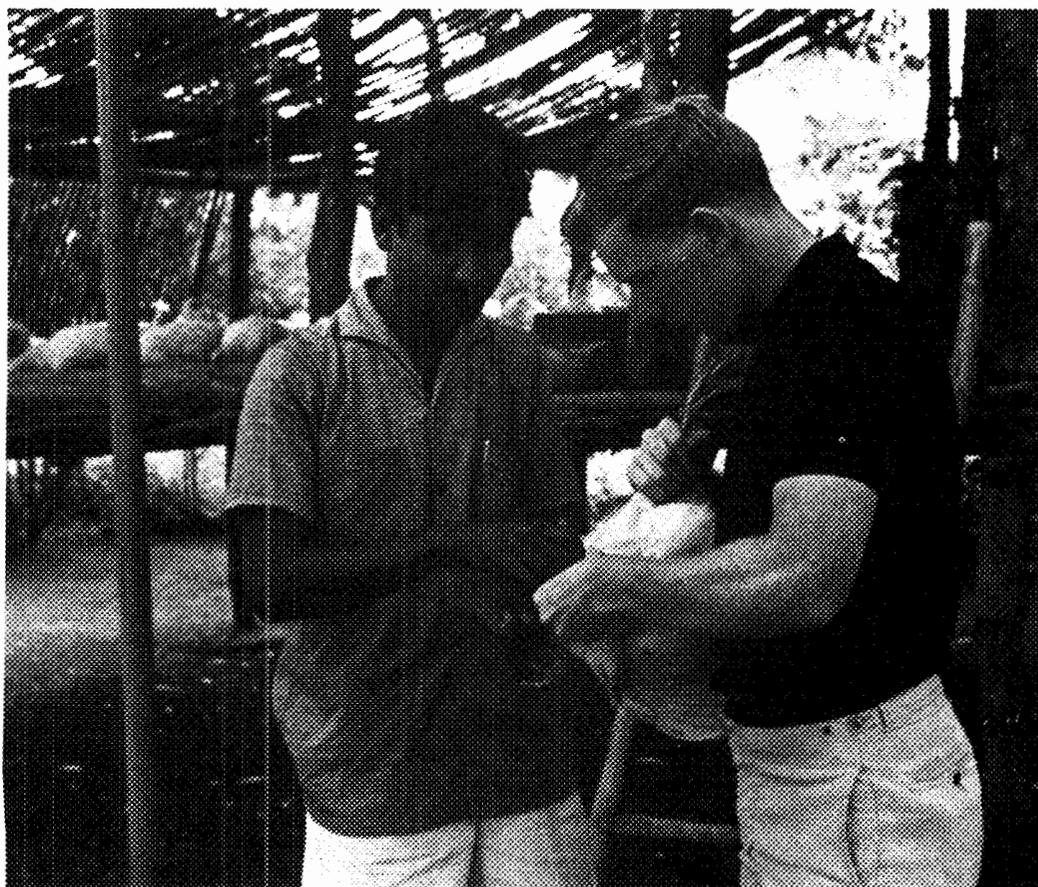
ces, Volunteers work directly
ips or with extension officers
apply cooperative techniques

ice takes many forms. In the
for instance, Volunteers co-
the Union Nigerian de Credit
ncy of the Ministry of Rural

e helping improve communi-
and policy-makers of the na-
direct operations of small co-
g the purchase and storage
farmers elementary arithmetic
produce.

50 Volunteers are serving as
s. They are assisting credit
ncy by holding educational
oving their organizational sys-
ccounting and auditing pro-
isting leadership as well as

specialized Peace Corps agri-
include technical aspects such
gation, soil conservation, farm
horticulture.



Volunteer Jerry Ziegler (right), working on a poultry development project in Hyderabad, India, shows an Indian farmer what to look for when inspecting chickens.



*development project, Volunteer Charles
with the assistance of an Indian farmer.*

1,000 in India

In India, the Peace Corps' largest program, almost 1,000 Volunteers are involved in various agricultural projects.

For example, farm mechanics and irrigation specialists are aiding farmers with the planning, surveying and construction of new irrigation systems required when the Nagarjungasagar Dam, one of the world's largest, begins irrigating three million acres of land there.

Eventually, other Volunteers will assist Indian farmers with crop planning, new cultivation practices and water utilization.

Volunteers in Malawi, between Zambia and Mozambique in southern Africa, are teaching farmers the basic facts about the causes and cures of diseases while others research the incidence, effects and causes of local cattle diseases.

Most Volunteers serving in Peace Corps agricultural programs are "A.D. Generalists." These are persons with college degrees in liberal arts programs who are trained by the Peace Corps to be specialists in a particular aspect of agriculture.

But an increasing number of persons with agricultural backgrounds—including retired farmers—are now participating in Peace Corps agricultural projects.

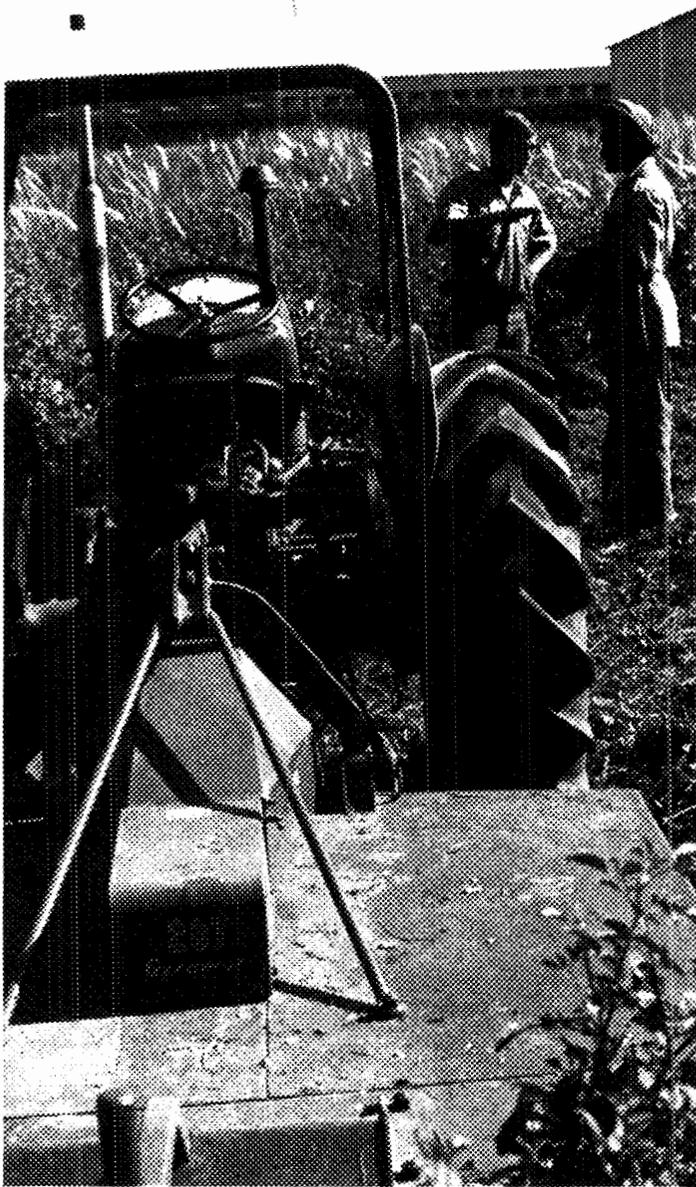
One of the most important aspects of the program, according to the Peace Corps, is the personal interaction between Americans and host country nationals.

Interchange of Ideas

So, while Volunteers are sowing seeds, they also are sowing ideas and attitudes, from which they reap new ideas and an appreciation for different attitudes. This all contributes to a plentiful harvest of agricultural advancement and international understanding.

Here are some examples:

- A Volunteer in India persuaded a neighbor, who lives in a stucco house, to build a chicken farm on his roof. This way, the man needs no extra land for his farm and he need not hire a night watchman because the only way to the roof is through the house. Another



Preparing to demonstrate a rotary mower at Punjab Agricultural University, India, Volunteer Garry L. Husk (left) explains how the machine operates.



Volunteer Clark Kerr works with students at the Kolo Agricultural School, which trains all of Niger's agricultural extension agents.

major advantage is that there is no smell . . . thanks to the wind. Everyone seems happy. The man is making money and the local population now has plenty of eggs. Even the hens seem to enjoy high living.

- "You're assigned to the village of San Jose," the newly-arrived Volunteer in Peru was told. So the young man headed north to the quiet fishing town.

"What to do first?" he asked himself upon arrival. He soon decided to attempt to convince the villagers to form a cooperative.

This way they could market their fish collectively and buy engines with their combined income to replace the sails on their boats.

The idea worked and the fishermen made enough money to repair the village's electric generator as well.

But there is a footnote to the story. The Volunteer achieved his success in the wrong village. The San Jose he was assigned to is in southern Peru, hundreds of miles away.

- "Wouldn't it be simpler to ship modern farm equipment overseas?" a friend asked a 62-year old retired farmer who had just returned after serving two years as a Volunteer in Latin America.

"Simpler, yes," replied the man. "But before we can send new tractors we have to help these people put metal tips on their wooden plows."

—Mike Keller



Are the Tropics a Future Breadbasket?

—FOUNDATIONS TO SEEK ANSWER

When the Rockefeller and Ford Foundations announced earlier this spring they would provide more than \$4.8 million for specialized agricultural research and training centers, they focussed further attention on the tropics as a possible breadbasket for hungry millions.

The world's food supply could be "doubled or tripled" if the best areas of the tropics are properly developed, Dr. J. George Harrar, President of the Rockefeller Foundation, declared at a press conference in April. He and David E. Bell, Vice President of the Ford Foundation, said some of the major difficulties lie in finding effective ways to solve soil problems and in developing varieties of grains that can survive extreme conditions, yet produce high yields.

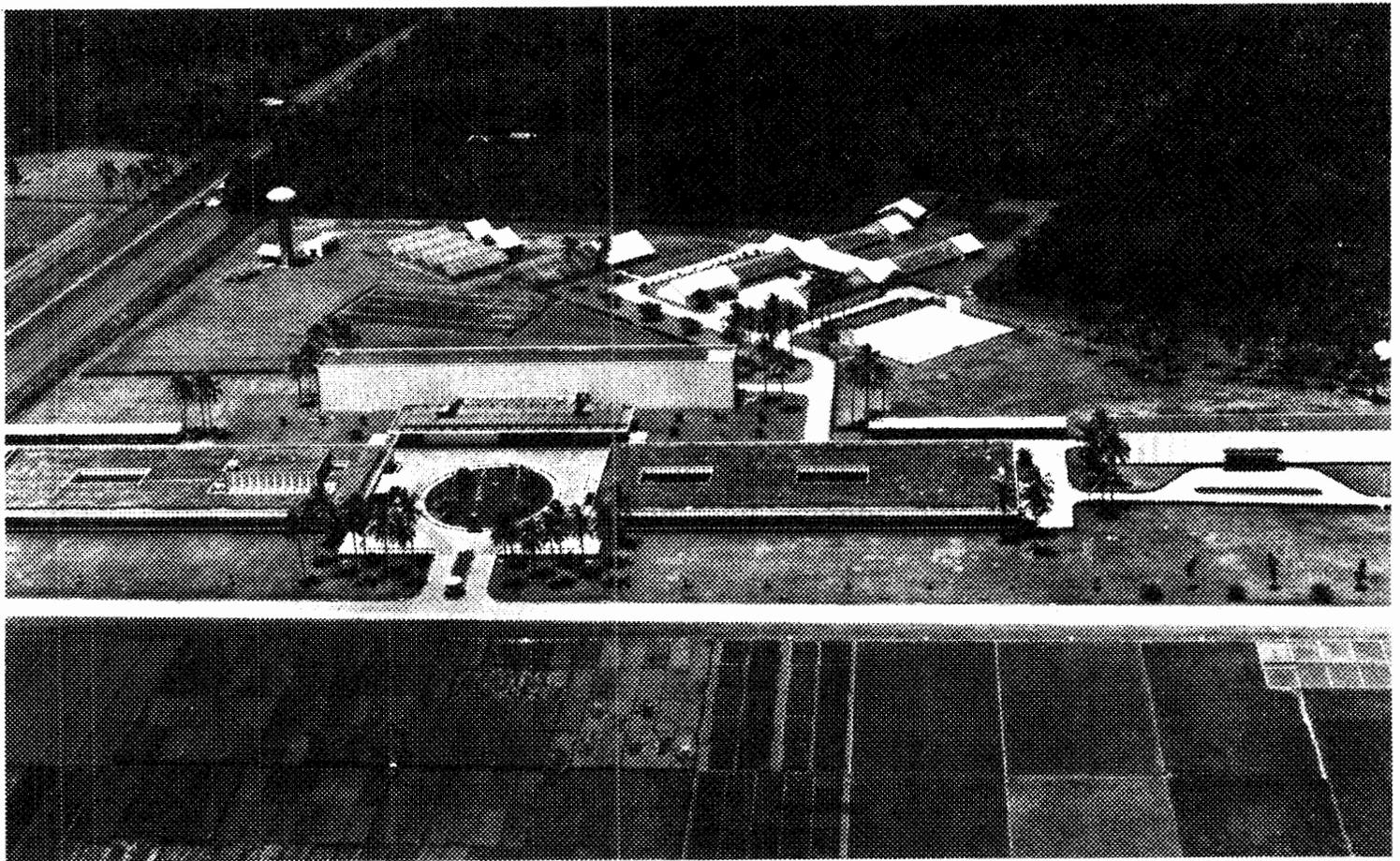
Photos: Rockefeller Foundation

(The Agency for International Development has financed a number of research projects in this field and is working with the foundations and other institutions in an effort to help boost tropical and sub-tropical food production.)

In furthering their particular role in seeking answers to problems facing many developing countries, the Foundations are establishing a new International Center for Tropical Agriculture (CIAT) in Colombia, and an International Institute of Tropical Agriculture (IITA) in Nigeria. Additionally, the jointly-financed International Rice Research Institute (IRRI) in the Philippines, and the International Maize and Wheat Improvement Center (CIMMYT) in Mexico received grants to expand their work.



Flooded paddies at the International Rice Research Institute in the Philippines -contrast traditional transplanting of seedlings (foreground) with direct placement of seeds by hand, and by mechanical drill.



Aerial photo shows the main buildings at the International Rice Research Institute, Los Baños, the Philippines.

Expect to Start Soon

The two new centers are expected to begin operations within a year. The CIAT center in Colombia will be concerned primarily with the lowland areas stretching from Central America through Brazil. Its findings, however, would be expected to benefit other tropical regions as well.

Mr. Bell said the Ford Foundation has provided funds for teams of agricultural science consultants for CIAT. They will lay the basis for decisions on initial priorities. The Center, which will be headquartered in the Cauca Valley at Palmira, is being developed jointly by the Rockefeller Foundation and the Colombian Government.

In addition to corn and rice research, carried out in cooperation with CIMMYT and IRRI, studies will be made of starchy food crops, such as cassava, sweet potatoes and plantain; grain legumes including soybeans, chick peas, pigeon peas and cowpeas; tropical pastures and livestock and tropical fruits and vegetables.

The IITA in Ibadan will also be concerned with problems of agriculture in the humid tropics. It is located in a densely populated forested area, where the need is to develop a stable, productive food-crop agriculture. Emphasis will be on crop and soil management systems for sustained productivity on rain forest soils; improvement in cereal crops; grain legumes, vegetable crops

and perennial legumes and grasses for soil improvement; livestock feeding, and control of diseases, insects and weeds.

More Research in Rice

IRRI, which developed the now-famous IR-8 "miracle" rice, received a total of \$2,566,550 from the two foundations, of which more than \$1 million will be used for protein quality studies, special training programs, rice research in East Pakistan and Ceylon, and improvement programs in Thailand and India. The remainder will be used for staff and operating costs.

CIMMYT, building on 25 years of cooperative effort between the Rockefeller Foundation and the Mexican Government, received \$1,845,000 to continue its research and development activities. The high-yielding "Mexican" wheats were planted on an estimated 10 million acres in developing countries outside Mexico during the past year. CIMMYT will expand its corn program in Kenya, Thailand, India and the Andean region of South America, as well as Mexico and Central America.

In announcing the new grants, both Dr. Harrar and Mr. Bell took issue with those who believe efforts to meet the food-population crisis are fruitless.

"It is not accurate to say there will be famine," Mr. Bell said in response to a question at the press conference. "But it is possible if we don't do anything now."

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3. Regional food testing and evaluation centers to ensure quality and wholesomeness of foods;
4. Exploration of village food industry potentialities and their development;
5. Diversification of agriculture;
6. Improved distribution of food;
7. Need for compilation of data pertaining to the effects of malnutrition and food composition;
8. Recipient country responsibility and self-help measures in supplementary feeding programs.

The Conference recommended that nutrition workers spend three to six months in other West African states, to coordinate exchanges of information by participating in and observing techniques and methods being used to further nutrition education.

Delegates from several nations expressed their belief that nutrition has not received the attention it needs and deserves in national planning. They called for the establishment within each country of Nutrition Commissions which would include high-ranking policy makers of the Ministries of Health, Agriculture, Education, Social Welfare, and other organizations working in the field.

Stress was also placed on the need for greater emphasis on nutrition and health courses in all school curricula, encouraging diversified agricultural production, and facilitating the movement of food within and between nations.

At the CENTO Nutrition Conference the keynote speaker, Dr. W. H. Sebrell, Jr., warned of the hidden danger of partial starvation.

Dr. Sebrell, Director of Columbia University's Institute of Nutrition sciences, told the Conference that partial starvation is "largely hidden because the deaths and the damage to growth and development are concealed in the small child in the lower economic groups, and the effect is an increase infant mortality, morbidity, and a failure to grow."

Malnutrition, Dr. Sebrell said, "often ends in death but is concealed in the mortality statistics because the death is attributed to diseases such as dysentery, measles, tuberculosis or pneumonia. Infection frequently exacerbates the effects of malnutrition while the malnutrition may result in death from the infection."

Dr. Forman reported that the CENTO Conference "exceeded expectations" in focusing attention on the role of the private sector in combatting malnutrition, the relationship between nutrition and family planning, and the necessity for coordination in nutrition programming.

"It is significant that the countries of Pakistan, Turkey, and Iran now all have nutrition included in their national plans," Dr. Forman said. "This was not true several years ago. I believe the Conference will help to strengthen and promote additional interest in nutrition on the part of these countries."



—Jack Doherty

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ing their poverty. But it is well to remember that Gandhi said, "If God should appear to an Indian villager it would be in the shape of a loaf of bread."

Experience is an even more important guide. It has been repeatedly shown that whenever poor farmers have a clear-cut opportunity to improve their lot, that opportunity is eagerly grasped. We can take a very simplistic view of the people in the poor countries. For all our present purpose we can think of them as human beings with the needs and desires that all men and women share simply because of their common humanity. All human beings want enough to eat, both in quantity and quality. All want their children to survive and be healthy. All appear to desire freedom, the ability to make decisions for themselves, and to have these decisions bring results. All desire some degree of privacy, some sense of security, some consciousness of individual uniqueness. All seek freedom from fear, uncertainty, hunger, and want. When they have a choice, most human beings prefer health rather than sickness, knowledge rather than ignorance, variety rather than sameness, entertainment rather than boredom.

Many of the fruits of the scientific revolution in the Western world have actually been harmful to the poor countries: sophisticated military hardware, for which the poor countries spend their vital subsistence; and synthetics—e.g., rubber fibers, leather, sweeteners—that are substitutes for many of the poor countries' principal exports.

The enormous technological superiority of the West in itself has a deleterious effect on the poor countries, because it acts as a magnet to pull away their ablest and best educated young people. Many thousands of scientists, engineers, and physicians on whom the poor countries have spent a significant share of their educational resources come to the United States and Europe to find careers in our hospitals, laboratories, and industries. A rough calculation indicates that this brain drain has a direct monetary cost to the poor countries of about \$300 million per year. The indirect cost in terms of their loss of priceless talent is incalculably greater.

What, specifically, can the United States do to help the poor countries benefit from the scientific revolution? There are many possibilities; I will not venture to give a complete list, but instead make a few suggestions. In the first place, it is desirable to obtain a greater involvement of American industry in agricultural research and development than presently exists. To do this, something besides the ordinary market mechanism must be utilized: we need to find ways, as we have with the defense and space programs, for our Government to be the market.

Perhaps of more importance would be the establishment of a Government foundation, similar in structure and policy to the National Science Foundation, which could provide long-term and assured support to American universities to build up their faculties and research staffs for overseas research, development, and teaching.

Research Needed

Technical assistance is generally thought of by both donors and recipients—the United Nations and its specialized agencies, our own Government, and the poor countries themselves—as the provision of wise advice by experts. But the development of new technologies does not require experts who possess knowledge that can be transferred, it requires research. And, as we all know, the best research is often done by graduate students and postdoctoral fellows. We ought to try to change the rules of the game of technical assistance to give ample opportunity for young American and European scientists to do meaningful, relevant and publishable research in the poor countries. This would have two major effects: much useful work would be done by the young people, and more professors would be willing to spend sufficiently long periods overseas if they were accompanied by their students. What I am suggesting here is a new kind of Peace Corps, one which would mainly recruit young research workers.

The fundamental question is a moral one: how can we learn to base our policies on love, rather than hate, hope instead of fear? I would claim that we in the United States will not long be able to retain our own humanity and decency, the mutual trust that makes democracy possible, in a world in which one-third of human beings get too much to eat and two-thirds are starving. Such a world will brutalize all its inhabitants. Even from the narrow point of view of our own short-range interests, it is clear that wherever poverty and misery exist, political instability and chaos are likely to arise. The only way we can be assured of a stable world in which the United States can live peaceably is to work for a diminution of poverty and misery everywhere.



Quotes

“Half of those now living and two-thirds of those still to be born in this century face the prospect of malnutrition, poverty, and despair. . . . In spite of the efforts and sacrifices that have been made, there are more, not fewer people living in distress and deprivation than a decade ago. This is the greatest challenge facing the United Nations and the world today. . . . All parents, rich or poor, should have, or be provided with, the facilities needed effectively to decide their own family size. I feel that there is no right more basic to humanity and more important to each individual than the right to enter this world as a wanted human being who will be fed, sheltered, cared for, educated, loved and provided with opportunities for constructive life.”

U Thant
Secretary-General, United Nations,
Spring, 1968

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“It is not a paradox to state that the first and the main victims of the population explosion are children. If the population of the world continues to increase at the current rate of about 2 percent per year, it does not appear possible for the governments and people of most of the developing countries (where the population increase rate is generally the highest) to provide the food, the health and welfare services and the education required in the foreseeable future for the ever-growing number of young.”

Henry R. Labouisse
Executive Director, *U.N. Children's Fund*, Spring, 1968

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“There are a number of reasons for feeling that businessmen who are making profits from the agricultural community should get their eyeballs focused above the horizon of the United States and look toward the starving masses of the ‘developing countries’ as a source of profit, and

at the same time become Prophets of Hope. And there is no reason to be ashamed of putting money in our pockets by helping other people put food in their mouths. We do it every day in the United States and Europe.”

Norman E. Hathaway, Velsicol Chemical Corporation, February, 1968

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“American wheat and cotton can pay the wages of workers who build railroads, who build docks, who build schools and hospitals. And American technical knowledge can help the countries of Latin America, Africa, and Asia discover new seeds, develop proper fertilizers, and fashion new methods to raise the level of agricultural output for these seething continents which now suffer mass hunger.

“We can provide know-how and equipment to build farm-to-market roads, assist in obtaining simple equipment to improve food production to help people to help themselves.”

Pat Greathouse, Vice President, United Automobile, Aerospace and Agricultural Implement Workers of America, AFL-CIO, February, 1968

* * *

“The seriousness of the international poverty crisis must not be underestimated. So far in this internationally designated ‘Decade of Development’ the developing countries as a whole have been slipping steadily backward in relation to their wealthier neighbors. While the per capita income of developed countries has increased at the rate of about \$60 a year, that of the developing nations has risen only \$2 a year. The share of the developing countries in world trade has been decreasing. Aid has fallen short of promised levels and is actually declining in relation to the ability of the donor nations to give. The annual burden of debt of the poorer nations is dangerously mounting—from \$10 billion to \$45 billion in the last decade.”

New York Times, April 1968



IN BRIEF

New Head of WFP

Francisco Aquino, Technical Manager of the Inter-American Development Bank, has been named Executive Director of the World Food Program (WFP), it was announced recently.

Mr. Aquino, a citizen of El Salvador, succeeds Addeke H. Boerma of the Netherlands, who became Director-General of the U.N. Food and Agriculture Organization (FAO) earlier this year.

The new WFP Executive Director has a broad background in agriculture and economics. After several years with the FAO, Mr. Aquino became Minister of Agriculture of El Salvador in 1961. He was President of the Central Reserve Bank of El Salvador, 1961-66, during which time he was also Governor for El Salvador in the International Monetary Fund and the World Bank.

Mr. Aquino is a graduate of the College for Agronomic Studies, El Salvador, and has a master's degree in economics from Harvard University.

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FPC Contract Awarded

The Agency for International Development has awarded the first contract to a private firm to produce fish protein concentrate (FPC) for Food for Freedom programs.

Alpine Marine Protein Industries, Inc., New Bedford, Mass., will produce 2,142,850 pounds of FPC at a cost of \$900,000. The product will be used to provide additional protein in foods distributed through the Food for Freedom donations under Public Law 480. These programs, administered by AID, provide commodities for school lunch, child feeding, food-for-work and similar activities.

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Senegal River Projects

A consortium of four international engineering firms has begun preliminary work, under a contract with the United Nations, on four development projects on the Senegal River.

The four projects have been approved by the U.N. Development Program (UNDP), which will work in partnership with the Governments of Guinea, Mali, Mauritania, and Senegal. The projects are aimed at exploitation of the river's potentials in the fields of power, agriculture and industrial development, and transportation.

Work on the projects is expected to last up to five years.

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Philippine Rice

With a rice surplus of 310,000 tons this year, the Philippines are now exporting substantial amounts of the IR-8 high-yield rice seeds.

Pakistan has already purchased 1,300 tons of rice seeds. Other shipments are scheduled for Israel, the United Arab Republic, Argentina, Iraq, Saudi Arabia, Indonesia, Kenya, and Burma.

In Print Recent Publications of Interest

The Task of Development, Agency for International Development, 1968; 40 pages, illustrated. Available on request from Information Staff, AID.

A description of the foreign assistance proposals to Congress for Fiscal Year 1969. Charts and photographs point up the programs, progress and problems of foreign aid. This non-technical publication is designed for the general public and seeks to present the current status of foreign-aid programs in relation to the past and future.

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Human Fertility in Latin America, by J. Mayone Stycos. The Cornell University Press, Ithaca, 1968. 320 pages, tables, charts. \$11.00.

The population growth rate in Latin America is the highest of any region in the world. Professor Stycos explores the complex of causes in research that ranges from projective testing of Haitian peasants to ecological correlations of Peruvian census data. The result is a wide-ranging study providing information and insights for anyone interested in Latin America or in the problem of population control in general.

Human Fertility in Latin America has also been published in Spanish by the Population Reference Bureau, Bogota. Part of the edition is being distributed by the Agency for International Development through the Regional Technical Aids Center, Mexico City.

Professor Stycos is chairman of the Department of Sociology and director of the International Population Program of Cornell University.

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The Health Center Doctor in India, by Harbans Takulia, Carl E. Taylor, Prakash Sangal, and Joseph D. Alter. The John Hopkins Press, Baltimore, 1967. 96 pp. \$3.50.

This unique study of the attitudes and insights of the men and women playing leading roles in the rural health center system in India is based on interviews with 170 doctors, administrators, medical teachers, and legislators. The authors—a social scientist, two physicians, and a statistician—discovered that, although the health center concept is basically sound, the operation of health centers in India has been greatly hindered by the lack of clear definition of what the doctor is supposed to do.

After analyzing the interview materials and placing the Indian health-center movement in historical perspective, the authors discuss recommendations for improvement as agreed on by Indian health authorities. This is one of the studies in The Johns Hopkins Monographs in International Health. It should be of value to all countries where health services are being planned as an integral part of general economic and social development.



KOREA'S Terraced Uplands

The conversion of hilly uplands to agricultural production through terracing is a major item in Korea's drive to increase food production.

Construction of terraces on sloping, under-utilized land brings with it a number of benefits. In addition to providing more land for cultivation, the terraces prevent soil erosion and control the runoff of rain water.

Preliminary work on terracing Korea's uplands began in 1961 with UNKUP—the U. N. Korean Upland Project, and has continued as a cooperative effort that has included the Korean Government, the Food and Agriculture Organization (FAO), and the U. S. AID mission in Korea. Since 1964 the terracing program has been supported by U. S. food donations under the "food for work" provision of Public Law 480. Through 1967 these food shipments amounted to 92,911 tons. Additional food is now being supplied by the World Food Program.



Because the terraces are hand built entirely by pick and shovel the project has given gainful occupation to thousands of persons, and during periods of short food supply.

By the end of 1967 about 182,000 acres of terraces had been built. It is conservatively estimated that there are at least one million acres of hillsides with a slope under 35 percent, suitable for terracing. Current plans call for having about 400,000 acres terraced and in production by the end of 1971.

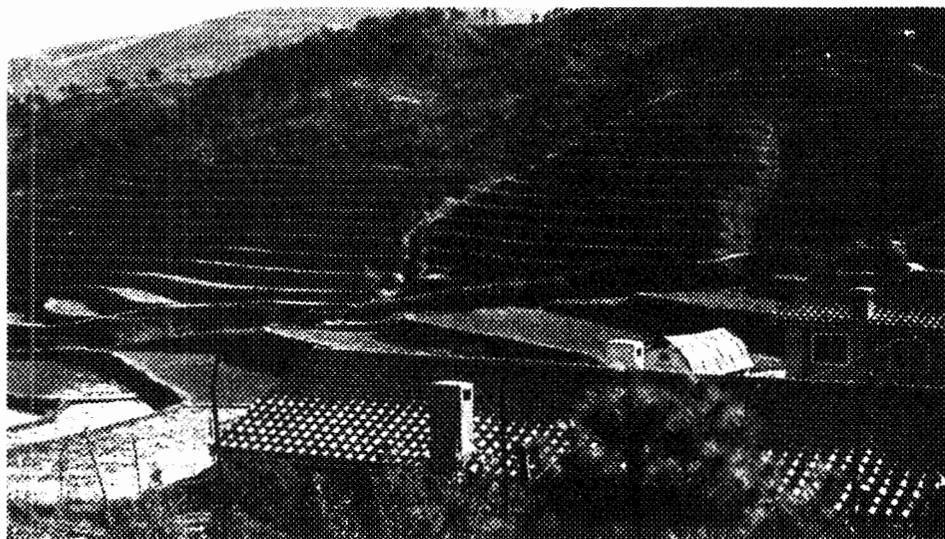
The terraces being built in Korea are of unusual design, with "backslopes" to prevent rain-water and melting snow from overtopping them, and "lips" on the leading edges as additional safety factors. These features, together with the methods used to farm the terraces, allow most of the precipitation to infiltrate into the soil to provide ground water for crops during dry periods.

All major Korean crops except rice grow well on the terraces. This includes barley, buckwheat, millet, rye, corn, sorghum, potatoes and sweet potatoes, soybeans, redbeans, vegetables and peanuts.

In addition, the terraces are well suited to long-term crops such as peaches, grapes, apples, and mulberries for silkworm feeding. The sodded risers which form the front of the terraces are ready sources of livestock feed and silage.

Robert D. Flannery, former UNKUP project manager and FAO Country Representative in Korea, describes Korea's upland terracing in these words:

"Here then is a country demonstrating resource management to the extent that once non-productive and eroding land is being placed under intensive agricultural use and yet in such a way that it will sustain production for decades to come. This has all been the result of many people of many disciplines, national and foreign alike, working together for a common good. One of Korea's basic problems—adequate food production—is on its way to solution."



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