Hunt Institute for Botanical Documentation
5th Floor, Hunt Library
Carnegie Mellon University
4909 Frew Street
Pittsburgh, PA 15213-3890
Telephone: 412-268-2434
Email: huntinst@andrew.cmu.edu
Web site: www.huntbotanical.org

The Hunt Institute is committed to making its collections accessible for research. We are pleased to offer this digitized item.

Usage guidelines
We have provided this low-resolution, digitized version for research purposes. To inquire about publishing any images from this item, please contact the Institute.

Statement on harmful and offensive content
The Hunt Institute Archives contains hundreds of thousands of pages of historical content, writing and images, created by thousands of individuals connected to the botanical sciences. Due to the wide range of time and social context in which these materials were created, some of the collections contain material that reflect outdated, biased, offensive and possibly violent views, opinions and actions. The Hunt Institute for Botanical Documentation does not endorse the views expressed in these materials, which are inconsistent with our dedication to creating an inclusive, accessible and anti-discriminatory research environment. Archival records are historical documents, and the Hunt Institute keeps such records unaltered to maintain their integrity and to foster accountability for the actions and views of the collections' creators.

Many of the historical collections in the Hunt Institute Archives contain personal correspondence, notes, recollections and opinions, which may contain language, ideas or stereotypes that are offensive or harmful to others. These collections are maintained as records of the individuals involved and do not reflect the views or values of the Hunt Institute for Botanical Documentation or those of Carnegie Mellon University.

About the Institute
The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

Rogers

UNIVERSITY OF COLORADO
BOULDER, COLORADO 80304

DEPARTMENT OF PHYSICS AND ASTROPHYSICS

April 29, 1969

TO: Faculty Participating in the World Food and Population Crisis Seminar

FROM: Dr. Lewis M. Branscomb L. B.

I. Schedule for the remainder of the semester

I have discovered that exams begin May 24th. Accordingly, we should plan to terminate May 20th. The following schedule was adopted at the April 29th meeting.

May 6 Presentation of the reports of Group JI and Group V.
May 13 Presentation of Groups III and IV.
May 20 Group I and overall evaluation of the seminar.

Since each group will have one hour, I suggest that a presentation of the group's work be prepared to cover about 30 minutes, with 30 minutes for discussion, the whole to be supplemented by the written paper or papers. The oral presentations obviously should be made by one or more students rather than by faculty. If you get papers already typed to my office at least 24 hours in advance, I will endeavor to have them xeroxed.

II. Grades

I recommend the following procedure for ensuring that the students do receive formal credit for their efforts.

Perhaps the easiest way to get the grades made out would be for the faculty to meet together for lunch in the Faculty Club on Wednesday, May 21st, at which time we would also have our own post-mortem.

a. The faculty discussion leader of each of the five groups should make a brief evaluation of the efforts and contributions of each of the students listed in that group, after consultation with other faculty who have been active in that group. These evaluations should be compared for general uniformity and then be redistributed to the faculty member responsible in the first instance for registration permission in each of the departmental listings. These individuals should insure that grades for the students for whose registration they were responsible are properly registered in the department. This list of grades should also be left with me so that I can check that every student registered for credit does in fact receive a grade in some departmental listing.

If anyone has a better idea on how grades can be made out, I will be glad to hear it. Le me also say that it would be my philosophy not to agonize about grades but to be liberal in giving A's to students who have been faithful in their efforts.

LMB:hg

3/13/69

WORLD FOOD AND POPULATION CRISIS SEMINAR

Study Groups

1. Goals for Mankind: Ethical Considerations — JILA 107

	Willard L. Fadner	Physics
	Edward Grossman	Political Science
	William E. Grove III	Physics
	Jay B. Mather	Geography
	Susan Mather	Anthropology
	Donna Stever	
	Gail Wallace	French
Chairman:	Gottfried Lang	Anthropology
	Lawson Crowe	Graduate Dean
	John C. Cobb	School of Preventive Medicine
	John Macinko	Modern Language Labs.
	Leonard Finegold	Physics

2. Population and Food Needs — JILA 307

	Duane C. Arneson	Marketing
	Vicki Sue Lowe	Biology
	Ronald Herman Marquhart	Anthropology
	John R. McNeill	Economics
	Roland L. Weaver	Zoology
Chairman:	Jane Bock	Biology
	Askell Löve	Biology
	Doris Löve	Institute of Arctic & Alpine Res.
	Roger K. Paget	Political Science
	David M. Prescott	M. C. & D. Biology

3. Physical, Biological, Economic and Behavioral Limitations — JILA 407

	Marcel John Arsenault	M. C. & D. Biology
	Elizabeth Brainerd	Sociology
	Frank Leathold	Sociology
	Margaret MacMorris	Mathematics
	David Mann	Civil Engineering and International Affairs
	Sandy Meyer	Zoology
	Mark P. Schapira	Aerospace
	Donald Erik Thompson	Marketing
	Wendy T. Warner	Marketing
Chairman:	Elise Boulding	Sociology
	Alice M. Brues	Anthropology
	Gerald E. McClearn	Psychology
	Meredith Runner	M. C. & D. Biology

4. How can the Food and Nutrition be Provided? JILA Tenth Floor

	Louis Kent Christensen	Marketing
	John C. Dumont	Aerospace
	Tom Fox	Anthropology
	Shirley Karen Isgar	Biology
	Beryl Simon Tesler	Zoology
	Bob Weakley	Electrical Engineering
Chairman:	Charles C. Slater	Business Research Division
	William Blumen	Astro-Geophysics
	Gilbert Hersh	Taximetrics Lab.
	R. Curtis Johnson	Chemical Engineering
	David J. Rogers	Biology

5. Politics and Organization JILA Tenth Floor

	Jim Brickey	
	Susan Bickell	Psychology
	Robert Bruegel	Sociology
	Gay Davis	International Affairs
	John McNamara	Political Science
	Suzanne L. Shaw	Political Science
	Scott von Stein	International Affairs
Chairman:	George A. Codding	Political Science
	Robert Hackenberg	Anthropology
	John P. Powelson	Economics
	Theodore Speiser	Astro-Geophysics
	Mahinder S. Uberoi	Aerospace
Overseers:	Lewis M. Branscomb	JILA
	Robert J. Low	Office of Vice President for Academic Affairs

Susan Bickell

WORLD FOOD AND POPULATION CRISIS SEMINAR

Study Groups

1. Goals for Mankind: Ethical Considerations — JILA 107

Elizabeth Brainerd	Sociology
Willard L. Fadner	Physics
Edward Grossman	Political Science
William E. Grove III	Physics
Jay B. Mather	Geography
Donna Stever	
Gail Wallace	French

Chairman:

Gottfried Lang	Anthropology
Lawson Crowe	Graduate Dean
John C. Cobb	School of Preventive Medicine
John Macinko	Modern Language Labs.
Carl McGuire	Economics

2. Population and Food Needs — JILA 307

Vicki Sue Lowe	Biology
Susan Mather	Anthropology
Roland L. Weaver	Zoology
Duane C. Arneson	Marketing
Ronald Herman Marquhart	Anthropology
John R. McNeill	Economics
Jane Siegel	

Chairman:

Jane Bock	Biology
Askell Löve	Biology
Doris Löve	Institute of Arctic & Alpine Res.
Roger K. Paget	Political Science
David M. Prescott	M. C. & D. Biology

3. Physical, Biological, Economic and Behavioral Limitations — JILA 407

Frank Leathold	Sociology
Margaret MacMorris	Mathematics
David Mann	Civil Engineering and International Affairs
Sandy Meyer	Zoology
Donald Erik Thompson	Marketing
Wendy T. Warner	Marketing
Marcel John Arsenault	M. C. & D. Biology

Chairman:

Elise Boulding	Sociology
Alice M. Brues	Anthropology
Leonard Finegold	Physics
Gerald E. McClearn	Psychology
Meredith Runner	M. C. & D. Biology

4. How can the Food and Nutrition be Provided? JILA 10th Floor

	John C. Dumont	Aerospace
	Tom Fox	Anthropology
	Shirley Karen Isgar	Biology
	Bob Weakley	Electrical Engineering
	Louis Kent Christensen	Marketing
	Mark P. Schapira	Aerospace
	Beryl Simon Tesler	Zoology
Chairman:	Charles C. Slater	Business Research Division
	William Blumen	Astro-Geophysics
	Gilbert Hersh	Taximetrics Lab.
	R. Curtis Johnson	Chemical Engineering
	David J. Rogers	Biology

5. Politics and Organization JILA 10th Floor

	Jim Brickey	
	Susan Bickell	Psychology
	Robert Bruegel	Sociology
	Gay Davis	International Affairs
	John McNamara	Political Science
	Suzanne L. Shaw	Political Science
	Scott von Stein	Political Science
Chairman:	George A. Codding	Political Science
	Robert Hackenberg	Anthropology
	John P. Powelson	Economics
	Theodore Speiser	Astro-Geophysics
	Mahinder S. Uberoi	Aerospace
Overseers:	Lewis M. Branscomb,	JILA
	Robert J. Low	Office of Vice President for Academic Affairs

Structural and Social-Psychological
Determinants of Fertility Differentials

Reading List

E. Boulding, Department of Sociology

Ecological Analysis General

Duncan, Otis Dudley, "Social Organization and the Ecosystem," in HANDBOOK OF MODERN SOCIOLOGY, Ed., Robert Garis, Rand McNally, 1964.

Daedalus, "America's Changing Environment," Fall 1967 issue.

Natural History, "The Unforeseen International Ecologic Boomerang," February 1969 issue.

Fertility Behavior

Journal of Marriage and the Family, "Family Planning and Fertility Control," May 1968 issue.

Journal of Social Issues, "Family Planning in Cross-National Perspective," October 1967 issue.

U.N. Publications

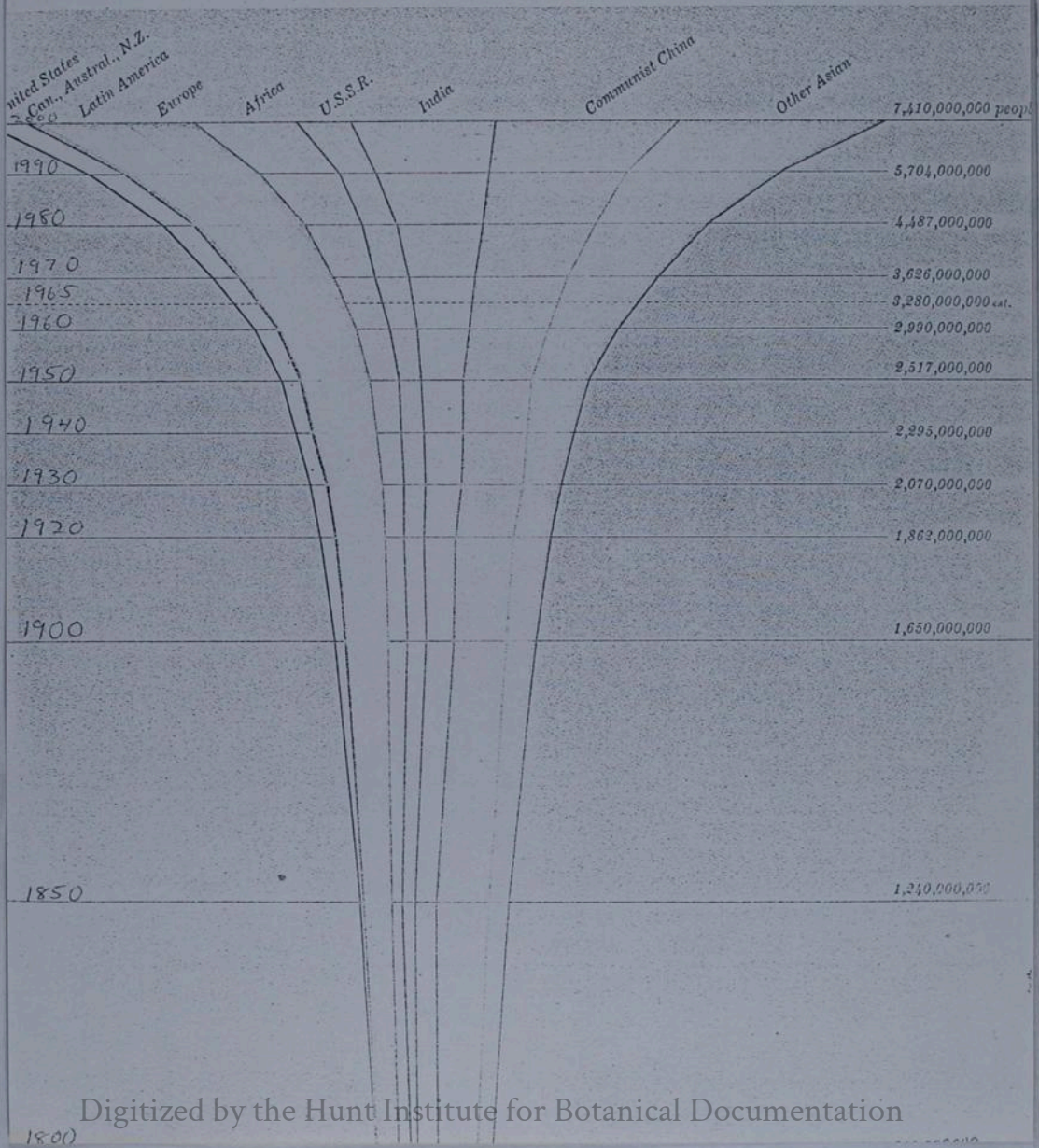
ECOSOC Inquiry Among Governments on Problems Resulting from the Interaction of Economic Development and Population Changes, E/3895/Rev. 1, 1964.

Population Bulletin of the United Nations, No. 7, 1963, "With Special Reference to Conditions and Trends of Fertility in the World."

Population Studies No. 33, "Demographic Aspects of Manpower, Report No. 1."

Statistical Yearbooks, U.N. Series.

What the U.S. Can Do about



World Hunger

by Duncan Norton-Taylor

No problem presses more remorselessly on this generation. Giving food away only postpones crises and may compound them. What the U.S. should be exporting is a practical version of the capitalist revolution that made its own agriculture one of the wonders of the world.

The prospect of a world whose population is doubling every thirty years or so has inspired a number of nightmares. Professor J. H. Fremlin, a prestigious physicist of Birmingham University in England, has described one he had in an article in the magazine *New Scientist*. Looking ahead eight hundred years, and speculating about how all the people would be fed, he saw how "waste products could in principle be changed back into food compounds with the absorption of little more energy. Cadavers could be homogenized," and additional photosynthesis for the production of extra crops could be arranged for by the orbiting of immense mirrors that would continuously reflect the sun around the earth. But the mirrors would have created an insoluble problem of overheating, and the world, having produced a population of 12 quadrillion, would then have reached, in Fremlin's phrase of finality, a "dead end."

But there are visions, almost as unpleasant as Fremlin's, that have the more disquieting effect of being real and immediate: of the human population stabilizing itself in the manner of the animal world—through mortal conflicts between species, through degeneracy and reduction in the birth rate due to stresses of overcrowding (what one experimenter with rats calls "pathological togetherness"), and through death from hunger.

Disease may simply stalk quietly through populations debilitated by malnutrition. Such visions come into closer focus in Mrs. Indira Gandhi's India, now not only threatened again by famine, but haunted by the realization that the production of its croplands continues to fall steadily behind the requirements of its multiplying population.

The same predicament in varying degrees of seriousness has overtaken about two-thirds of the people of the world. The leaps in population are most rapid in those regions least able to support them—the so-called underdeveloped nations, sometimes politely called the "less developed," or "developing," nations. The French have a noncommittal phrase for them—the *tiers monde*, which limits the grouping to those underdeveloped countries not in the Communist bloc, thus reducing to some extent the magnitude of our concern. But in this struggling area, which we cannot cast out, are most of Africa and Latin America, and an Asia that still includes, most burdensomely, India with its 500 million. This is the Third World, crying out, not always humbly, for help.

No problem presses on this generation of men more remorselessly. Few decisions or actions (outside of a nuclear decision) will be more critical in the next few years than those taken to resolve this dilemma of populations and human sustenance. All of modern humanism's skills and technologies are available to get the world out of its predicament at least in this century. The test is one of men's will to act.

The burden rests heavily upon the U.S., which for two decades has been sharing its abundance with hungry nations and now is called upon to rush emergency aid to India. But this country cannot continue on this course indefinitely, and shouldn't if it could, for such handouts merely put off crises, and even compound them. If there is any discernible solution it must be to raise the Third World to a state where it can feed itself. The point is being made over and over again today by Congressmen and the President, to each other and to the needy nations. But how is it to be brought about?

They have no simple answer—there is none. But certainly one answer must lie in what the U.S. has accomplished for itself and how it has done it. This nation has been able to grow food to a fantastic extent beyond the needs of its people. Granted its natural endowment of land,

Vision of the World Population: 2000 A.D.

The expanding bands on the chart show how the world's population, unless checked, will swell to a total of 7.4 billion in the next thirty-four years. A good deal more than half of all these people will be living in Asia, in regions least able to support them, and some 860 million will be in Africa; the U.S. population will grow more slowly, from the present 195 million to 362 million. The projections are based on "continued trends" figures put out by the United Nations. (Figures to 1900 are from J. D. Durand of the University of Pennsylvania.) The U.N. statisticians themselves believe that birth-control measures will interrupt this seemingly implacable growth and may even hold the figure down to around six billion by 2000. Other experts are skeptical of such optimistic prospects. In any case, the chart tells the story of what is happening as the world's populations grow by leaps and bounds.

land through the exploitation of technology and capital investment. These are the American products that both the government and American business should export in quantity to the agricultural economies of the Third World.

Capital can build irrigation canals in India, supply pumps and tube wells to tap the fresh water under the saline marshes of the Indus River basin in West Pakistan. Capital can supply tools and machinery, pesticides, fertilizers, provide training in modern methods. Most important of all, U.S. capital can create an atmosphere that is conducive to self-help. In the countless analyses of the subject, one fact stands out: that is the lack of incentive in the poverty-stricken, potentially rich, farmlands of the Third World. The factors inhibiting food production are traditionalism, lethargy, and hopelessness, not, at the moment, any lack of arable land. Capital generates incentive by producing goods and creating demand, and it widens the distribution of the fruits of labor. This is the market system so familiar to Americans.

The difficulties of transplanting the process are undeniable. Socialistic prejudices, hostility, and suspicion confront U.S. capital. American businessmen are reluctant to move into such an inclement and ostensibly unrewarding environment. But in the urgency of the situation, solutions to these difficulties must be found, and some, indeed, have been found and are being pressed by enterprising businessmen and administrators. It is inconceivable that there should be no answer at all to the dilemma.

A hypothesis: 48 million left to starve

Let us look at the dimensions of what is sometimes sportingly called the race between people and food. As the chart on page 110 indicates, the world population has doubled since 1900. Nothing is altogether inevitable, but enough female children have already been born to produce enough babies to raise the population to 7.4 billion by the year 2000. The populations of the Third World, which now number about 1.5 billion, are growing at rates of around 2.5 percent a year. The enormity of this growth comes clear when one realizes that, at the 2.5 percent a year rate, Latin America will go from 212 million in 1960 to 569 million in the year 2000.

The sudden acceleration of population growths all over the world began in the Forties, when the availability of DDT and the antibiotics transformed a problem that was only slowly evolving into the dimensions it has now attained. Death rates began dropping abruptly. Right after World War II they were as high as thirty per thousand in many of the Third World countries, and since then they have declined to around twenty. Meanwhile the birth rates in the Third World have continued to exceed forty per thousand.

Birth rates may be the more opaque side of the dilemma. While farming isn't much fun, as one corporation economist remarked, reproducing is. There is also a poignant aspect to the situation: peasants in poverty-stricken regions look to their children as a kind of social security for themselves in an uncertain old age; and the higher the infant mortality rate, the more babies they are apt to produce. But this also suggests an encouraging angle: an improvement in economic conditions tends to lower the birth rates. In highly developed Western European countries, birth rates are down to about seventeen per thousand. It would be tragic, however, to wait on such a development for the situation also works the other way around: increasing hordes of hungry people retard economic progress.

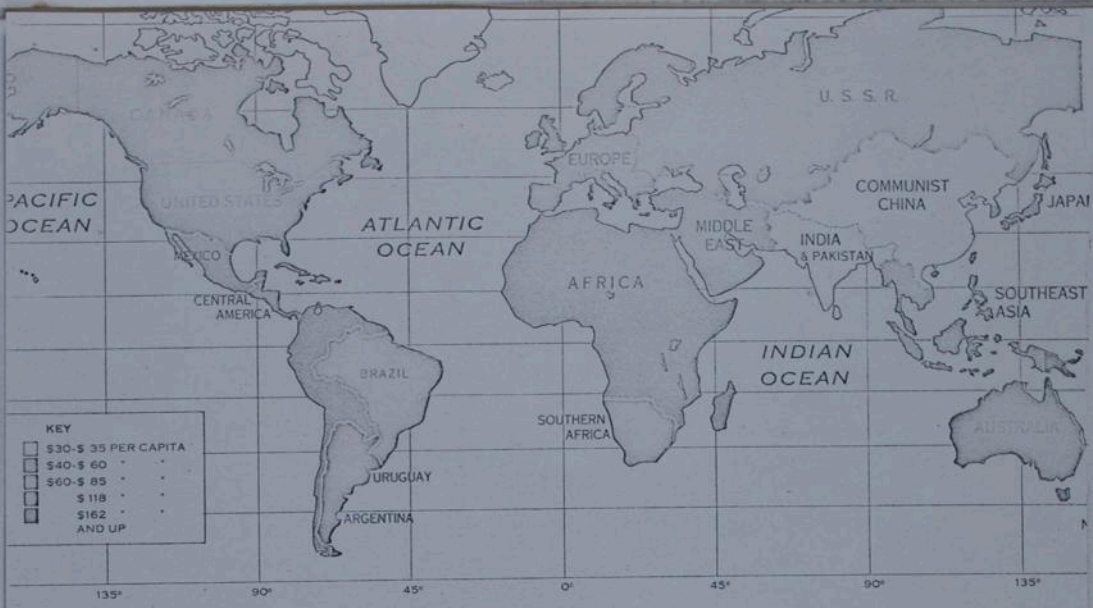
The Geography of Plenty and Want

The map shows the dollar value of food production capita in the subregions of the world. The countries ored in the darkest shade of green have the hig farm productivity, and they are all net exporter food. The deeply shaded area in South America, example, is the bountiful Rio de la Plata region, wh spreads across both Argentina and Uruguay. S countries, such as Taiwan, Greece, and Israel, s comparatively low food production but generate eno foreign exchange from exports to feed their pe adequately. There are, of course, undernourished pe even in areas of high production. In many count the uneven distribution of food, particularly of de able nutritional quality, is a pressing domestic prob The map is not a picture of the world's croplands; example, no food to speak of is grown in the north wastes of Canada, but Canada's small population l very well off the wheat fields of Manitoba, Albe and Saskatchewan.

And the hordes have been getting hungrier. Before the war, according to the American Society of Agronomy, the countries of the Third World were, all together, net exporters of some 11 million metric tons a year of corn, wheat, rice, and other grains to the world's industrial nations. From 1948 to 1952 the flow reversed: the Third World countries imported an average of four million tons a year. As population growth gained momentum (and as many people migrated to urban centers), the net flow of imports increased: to 13 million tons a year between 1957 and 1959, to 25 million tons in 1964. It was not a matter of increasing trade but a matter of want. Even the 25 million tons were not enough to make up the growing food deficits.

The size of these deficits is difficult to measure with any exactitude, because opinions differ (as they differ in almost every aspect of the subject of food) as to what precisely constitutes an adequate diet. A Department of Agriculture study ("Changes in Agriculture in 26 Developing Nations") fixed on some 2,500 calories per day as adequate, which is about the average consumption in Mexico, and posed an interesting hypothesis to illustrate how short of this level was India's average food consumption in 1963. If India had distributed its supply of food as far as it would go even at only a 2,300-calorie level, 48 million out of that country's 480 million in that year would still have been left totally without food.

The study found an average per capita intake of calories below "desirable" levels in eleven of the twenty-six countries it examined: Colombia, Tanganyika (now part of Tanzania), Sudan, Tunisia, Egypt, Iran, Jordan, India,



Pakistan, the Philippines, Thailand. And because of the uneven distribution of food in the other fifteen countries, many people there were suffering from malnutrition and undernutrition. Diets barely adequate in calories can be hazardously low in nutriments, such as proteins, necessary for good health.

At a seminar of experts in Estes Park, Colorado, last summer, the prediction was made that in 1980 the deficit in the underdeveloped countries would be somewhere between 47 million and 240 million metric tons of food, depending on whether populations were to be fed subsistence diets or adequate ones. These figures included mainland China; by removing China one reduces the overall figures somewhat (by around 25 percent) but this statistical exercise doesn't relieve the plight of the rest.

How capital can "substitute for land"

There is hope in one statement in the Agriculture Department report: most of the countries of the Third World have the potential of feeding their own people *and could have surpluses* within ten to twenty years. That hope rests on pointing economic development toward attaining self-sufficiency in food. One economist, Professor Theodore W. Schultz of the University of Chicago, takes encouragement from the way capital has transformed some of the old and congested farmlands of Europe, an experience more pertinent, perhaps, than that of the U.S., with its huge acreages. In his book, *Transforming Traditional Agriculture*, Schultz observes that Western Europe "with a population density much greater than Asia's and with a poor endowment of farm land generally, has been increasing its agricultural production at a rate that would have been thought impossible only a couple of decades ago. Italy, Austria, and Greece, for example, with less arable land per capita than India and with farm land inferior to India's, have increased agricultural production at a rate of 3.0, 3.3, and 5.7 percent per year respectively, compared to 2.1 for India."

"New land obviously is not the explanation," says Schultz. "It is the same old endowment of mostly poor land. If anything, the total area devoted to arable farming has been declining somewhat." In Israel, heavily populated by European stock, "between 1952 and 1959, production more than doubled although farm employment rose only a fourth." Israel's growth, too, was stimulated by capital investment. As in Europe, it created the factors of production "that substitute for land": modern implements, machinery, new seed strains, chemicals to fight pests and plant diseases, chemicals to enrich the earth.

India's story is a sorry contrast to this kind of progress. But at the same time India is a good case study of what capital might do to lift a poor country out of its ruck. As recently as 1952-53, India's annual output of chemical fertilizer nutrients totaled only 60,000 metric tons. Now it produces nearly 400,000 tons a year and uses more than 700,000 tons of fertilizer. It is estimated that India could increase production by 50 percent in the next five years if it improved its methods of farming and used three times this amount of fertilizer. India cannot afford to import such amounts, being lamentably short of foreign exchange. But with its own fertilizer plants, it would be freed from the need to import fertilizer and eventually

the need to import food. Scarce foreign exchange could go instead into modernizing production and processing facilities. (One lack is up-to-date storage. Uncounted tons of grain are destroyed by rot and rats.) In time, India might even be able to export food and thus earn exchange for industrial development.

The injection of outside capital into the agricultural economy would also tend to draw out native capital from India's financial institutions and, what is especially important, from the farmers themselves. The Agriculture Department declares that most of the twenty-six developing nations it studied "probably have a larger capacity for savings and new capital formation than their per capita incomes and past rates of capital accumulation indicate." An Indian farmer, with an investment of no more than $68 in livestock and $11 in implements and machinery, may arrive at the end of the season with a small cash surplus. But instead of using it to buy more efficient implements or fertilizers, or even to acquire more land and thus increase his next season's profit, he puts his money in jewelry, or splurges it on ceremonies of birth, marriage, or death. The hope is that deep-seated customs will change under the impact of modern capitalism.

The critical failure of PL 480

For a number of years, of course, the U.S. has been pouring capital into the Third World—and on a large scale. Billions of dollars worth of government aid has gone out from these shores in both currency and commodities. The unhappy part is that U.S. foreign-aid policy, for one reason or another, has so far failed in one vital respect: it has not made the indigent countries able to feed themselves.

In the last eleven years the U.S. has shipped, mostly to Third World countries, food that has cost it some $25 billion. Some of this food was shipped in emergencies and the recipient countries were not billed for it at all. Most of the tonnage was paid for in local currencies, which can enjoy only a vague kind of status in the Budget Bureau's accounts. This was the food that went out under the legislative aegis of Public Law 480.

PL 480 was originally put together in the Eisenhower Administration with the idea of disposing of some of the country's large Commodity Credit Corporation surplus; helping stave off famine abroad; encouraging the export of U.S. agricultural products, and world trade; and promoting U.S. foreign policy. The program (once called "Food for Peace" and now probably to be renamed, at President Johnson's suggestion, "Food for Freedom") has been put to many splendid uses. It saved an uncountable number of lives; it did level off U.S. surpluses—wheat, for example, is now down to what is deemed a prudent reserve. And the act did foster world trade in agricultural commodities in several instances and to the profit of American business. In 1954, Taiwan was unable to purchase anything from the U.S.; in 1965, no longer in need of aid, it bought $36 million of U.S. farm products. Japan, which has received $376 million worth of PL 480 aid since 1954, is now a spectacular world trader and the U.S.'s biggest customer for food grains. These success stories were right in line with what a lot of people kept thinking PL 480 was supposed to do in the end: put a billion and a half people in the Third World on their feet. But it never did.

The failure grew partly out of some early notions about priorities. The experts urged the Third World countries to get cracking first on industrial development, on the theory that they needed to create foreign exchange and this was the way to do it. In India, American food shipments along with some substantial improvement in India's own farm economy (which was soon to level off) gave rise to a complacency about the onrushing population and rising demands. Instead of helping India to learn how to feed itself, PL 480 had a disincentive effect on agricultural development. The Indians strove proudly to industrialize. "Nothing was dearer to their hearts than steel mills," says an Agriculture Department economist. Professors and Indians were not the only ones making the mistake. "In the mid-Fifties," the economist recalls, "American bankers and U.S. foreign-aid people examined the underdeveloped countries. They were interested in seeing them develop industry, not agriculture."

Despite the worsening food situation, the idea of giving priority to industrial development has persisted. PL 480 provides that the local currency a country pays for the purchase of American food can be borrowed back for various investments that the U.S. approves of, or given back to the countries in grants. The three countries that have received the most PL 480 aid are India, Pakistan, and the United Arab Republic, and not surprisingly, they are the biggest recipients of such loans and grants. India has put very little of such money into agriculture, Pakistan a bit more. Most of these funds went into industrial development and public works. Egypt, so far, has put almost nothing at all into agriculture, but has put $22 million into industry, $403 million into an account merely labeled "general and miscellaneous."

Let 'em eat sugar

U.S. policy under PL 480 was muddled by conflicts in goals and responsibilities. Legislative direction and effective control of the program lay with the House and Senate agricultural committees, whose members, coming chiefly from the South and the Midwest, had to keep in mind their farming constituencies. The Department of Agriculture has obediently carried out Congress' demands for protective restrictions. Herbert Waters, assistant administrator for material resources in the Agency for International Development, recalls how the earnest efforts of his office to promote self-help were undone by such restrictions. Shipments of U.S. wheat encouraged South Koreans to get away from their almost exclusively rice diets, as a result of which they had a rice surplus. They wanted to sell some of it to Japan. But Agriculture made it clear that so long as the South Koreans were getting PL 480 wheat they couldn't export their rice. Eventually they were permitted to do so, but only if they bought a ton of U.S. wheat for every ton of rice they exported. Such protectionism was also applied to the export of Pakistani rice to India. And since Turkey was getting PL 480 soybean oil, that country was tied down in its export of olive oil.

One promising innovation in the program was the provision for so-called "Cooley loans," named after Chairman Harold Cooley of the House Agriculture Committee. The local currency proceeds from the sale of U.S. commodities may be borrowed by U.S. firms that might want to do business in the Third World or by local people who are going to buy U.S. goods. But this borrowing is further circumscribed. A rider disallows such borrowing when the enterprises might be competitive with a domestic American enterprise. Who would have thought that a mushroom venture would come under such a ukase? But a request for such a loan in South Korea has been shelved because AID recollected how help given to mushroom

growers in Taiwan had once stirred up Congressman Paul Dague's constituents in Pennsylvania's mushroom country. Dague is ranking minority member of the House Agriculture Committee.

Now, with PL 480 about to expire and the time come to devise a new program, this attitude is changing, according to Chairman Cooley. "Some members still think we shouldn't encourage people to compete with us. But the feeling is not as widespread as it was. The new concept is to help the countries help themselves."

But one exchange during the House hearings on a new bill indicated that some Congressmen may be hard to budge. Vice Chairman W. R. Poage, of Texas, expressed his exasperation over the fact that India was producing about five million bales of cotton. "That land that is producing cotton could produce food," he told Secretary of Agriculture Freeman, who was testifying before the House committee. "I see some folks are laughing about this," Poage noted, "but to me it is a deadly serious problem." Why shouldn't the U.S., he demanded, tell the Indians to put some of that cotton acreage into something they can eat? "We can say that to them. And let us say to them that we will give you cotton to take the place of what you do not grow." And, for that matter, Poage wanted to know, why should the U.S. be buying sugar from India? "They ought either to eat it themselves," he said, "or they ought to be growing something on that sugar land they need themselves."

"It is not a simple problem, as I know you thoroughly realize," replied Freeman. "If you rejected desperately needed exchange that India might get by selling sugar, which she would use to buy fertilizer, and that fertilizer in turn makes it possible for them to double their wheat and rice output—why you then would come to the conclusion that we either say, 'We concur in your producing sugar or cotton,' or we say, 'We will make the fertilizer available.'"

After this mild demurrer, the Secretary retreated, breathing at one point, "If anybody in Washington needs any advice it is me. Thank you for any you have given me."

So it remains to be seen just how Cooley's "new concept" will work out.

Message from a Dutch uncle

President Johnson, for his part, seems determined that the Third World should now understand that the U.S. is inclined to help only those who help themselves. With an air of having reached the end of his string, he stipulated in messages to Congress early this year that the financing of the bulk of American food shipments must eventually (within the next five years) be in dollars instead of local currency. Under the current program there have been some hard-currency transactions on credit terms as long as twenty years at 2½ percent. Less than 10 percent of such loans so far have been paid back.

But the most significant passages in the President's message were aimed at the Third World itself. From now on, he said, the recipients of U.S. aid must "make basic improvements in their own agriculture . . . bring the great majority of their people—now living in rural areas—into the market economy . . . make the farmer a better customer of urban industry and thus accelerate the pace of economic development."

The President, while sounding like a Dutch uncle, was not threatening to let the Third World starve: "Even with their maximum efforts abroad, our food aid will be needed for

many years to come." Nevertheless, he gave the Third World something brand new to think about, not the least of which was its attitude toward U.S. aid, public *and* private. "Only these people and their leaders," he said, "can . . . create the climate which will attract foreign investment."

"Threats and rumors of expropriation"

The climate has been rough. A committee of businessmen, educators, and government and labor leaders, headed by Arthur K. Watson, chairman of I.B.M. World Trade Corp., studied the problem of "Private Enterprise in Foreign Aid." And in its report last summer it pointed out that while U.S. businessmen are used to taking risks, not many of them are accustomed to accepting "political instability, threats and rumors of expropriation, systems of pervasive discretionary regulation, prospects of rapid inflation and devaluation, and other novel features of overseas investment." And in the face of all this, the eagerness of U.S. capital to go into the underdeveloped countries is petering out.

Watson's committee found that a total of $13.3 billion of U.S. private investments had been put into underdeveloped countries up to 1964. But the *rate* at which these investments are increasing has been insignificant, compared to the needs and possibilities. And most of the increase has been in the more advanced countries, especially of Latin America; roughly 20 percent of the increased capital was from profits generated in these countries and plowed back. Petroleum and mining, not surprisingly, accounted for well over one-half the $13.3 billion; manufacturing for $2.5 billion, and "other" business activities for $3.3 billion. Very few companies have been willing to risk scratching for profits on the farms: some manufacturers of chemical fertilizers (including a few oil companies) and a few food-processing and farm-equipment firms.

The committee for its part made certain proposals aimed at the President himself. It recommended that the U.S. Government should accept the idea of international arbitration of investment disputes; it should support an investment code under international sponsorship; there should be an increase in government guarantees against overseas losses due to inconvertibility, military hazards, etc. And the income-tax laws should be amended to encourage overseas investments. The committee also recommended that AID select a number of key countries for intensive study and that an explicit program be developed for the improvement of the investment climate in those selected countries.

"We give the farmer a reason to grow"

A few companies have taken their narrow chances in the agricultural economies of the Third World. It is interesting to see how they are making out, for it does indicate what capital can do with encouragement. These ventures cannot be said to be very large, but the companies are doing moderately well or they wouldn't be planning to expand, as some of them are, cautiously.

Corn Products, for example, is introducing Latin Americans to such novelties as milk fortifiers, baby foods, custard powder, and packaged soups. Its wholly owned subsidiary in Argentina, Refinerias de Maíz, buys all its supplies locally, thus providing a cash market for the farmer. Management of the operation is in local hands.

Corn Products has also found a way to enrich edible corn starch with soybean oil, which it is marketing under the label [illegible] margin of profit o this new food the company is showing Brazilian farmers h

to grow soybeans, which now have to be imported from the U.S. "We're part of the economy," said Alexander McFarlane, Corn Products' chairman. "In a modest way we give the farmer a reason to grow." What concessions does Corn Products want in a foreign investment? "No harassment. Equal opportunities with the national companies—no special favors. If we're treated equitably, we'll take our chances."

H. J. Heinz is in Venezuela with a subsidiary, Alimentos Heinz, which processes vegetables and fruits grown on small farms. Heinz introduced new strains that give better quality and yields. Junius F. Allen, in charge of Heinz's international operations, relates that the company built a factory in the farming town of San Joaquin (pop. 6,000). "We went in as the first steady industrial employer. The reactions of people to steady income were marked. They began to wear better clothes. At first they'd just peer into our cafeteria or just buy a Coke. But after a time they began to eat the hot lunch. They began to buy bicycles to get to the plant. It was the first step up, the first kind of mobility. We improved their standards in hygiene by providing clean washrooms. People respond to example. Perhaps an even greater impact was made on the agriculture of the community, for Heinz supplied a market for their produce which had not existed before. Heinz provided assistance which allowed the farmers to increase their yield and hence their incomes. The average yield of tomatoes of these farmers, for example, doubled in four years."

Sermons in half a dozen dialects

In Brazil, Mexico, and Peru agricultural services are provided by Anderson, Clayton for local farmers who grow cotton seed, peanuts, and soybeans for a line of cooking and salad oils, shortening, and margarine that the company processes and markets. It finances seed, fertilizers, and insecticides, and gives advice on planting and harvesting. The plants provide plenty of local employment—6,000 jobs in Brazil, 4,500 in Mexico, 800 in Peru—and Anderson, Clayton feels, like Heinz, that it is generating incentives by providing the means for a higher standard of living.

Not the least of the handicaps these companies have to overcome is that of communication in regions where the illiteracy rate may run as high as 50 percent. Esso Chemical, which has worldwide fertilizer operations through affiliates, has developed a system of chain teaching; they train their salesmen to train local people, who in turn train larger groups to go out into the fields and preach capitalism and modern farming—sermons that may have to be rendered in one of half a dozen different dialects. International Minerals & Chemical is carrying the message of fertilizer into every corner it can reach. The gist of its sermon: NPK (nitrogen, phosphate, and potash) is a substitute for land; i.e., it can multiply the yield of one acre as many as 500 times. The average consumption of fertilizer nutrients in the Third World countries is around five pounds per acre. Some Dutch farmers use as much as 400 pounds per acre.

Some U.S. firms have already set up fertilizer plants abroad on a limited scale. I.M.C., with Standard Oil of California, is building a $70-million plant in Visag in India with a capacity of 350,000 tons, which should be in operation in 1967. I.M.C. and Standard have accepted a minority position in the Visag enterprise; Indian interests own 53 percent. This is not the kind of situation that appeals to very many U.S. corporations; they are reluctant to grant even a minority position to Indian interests, which may not appreciate the vigorous ways American business does things. But

Armour is in a deal with India's big industrial firm of Birla Gwalior Ltd. to operate a $50-million ammonia-urea complex in Goa. The two companies hold 51 percent of the equity; Indian private money has taken up the rest.

A plan for 20 million peasants

These companies have been fairly bold, within the limits of their accountability to their stockholders. They have been resourceful and sometimes imaginative. But some people who have studied the problem believe that it calls for an even more creative approach.

One such person is Simon Williams, a consultant once hired by I. M. C. to do a survey of world hunger. He has a scheme he would like to test with a pilot project in Mexico, where he would set up a corporation in partnership with 1,000 small farmers under "paternal" American management. The farmers would share ownership of the corporation through stock purchased on credit and paid for out of the surplus crops Williams is sure they could produce under skillful direction. He saw such a corporation financed by some $5 million of equity capital within ten years and working capital of $2 million to $3 million. Williams admits that the decision on the part of Americans to invest must "be motivated primarily by the desire to increase food supplies and to stimulate rural economic development."

Nevertheless, he sees American investors making a "substantial profit every year, as well as recovering their investment in twenty years." In those twenty years the farmers would have acquired ownership of the corporation. Williams has confidence in their intelligence and thriftiness. "We have to find new forms of organization," he says, "that will be acceptable to both capital and the political powers. We need new institutions, new attitudes so that investment can become meaningful. The opportunity was never better than now to experiment with new forms."

But the idea looked much too experimental to one banker who studied the scheme. He thought it was a fine notion bu pretty idealistic and he was not sure Williams had figured out a feasible debt-equity ratio. "No banker would touch it with a ten-foot pole," he said. I.M.C., for its part, decided it had "too many other things on its plate."

The fact is, Charles Dennison, an I.M.C. vice president has an interesting scheme of his own for India. (I.M.C. want it to be known that the plan is Dennison's, not the company's.) An earnest and ebullient man, Dennison proposes to set up a consortium that would include a fertilizer company, seed, insecticide, and pesticide companies, a farm implement maker, a fisheries enterprise, and a food processor all under one top manager. The project would be capitalized at something around $100 million. Indian private investors would be invited to subscribe for shares; most of the debt structure would be government money, in rupees, including PL 480 rupees, which could be used to purchase made-in-India components for the consortium's facilities.

The consortium would train the farmers in a selected geographical area, and would sell them the products of its various technologies. "The Indian farmer is illiterate but shrewd," says Dennison. "Education is the heart of the thing." The consortium would go into operation with 1,000 to 2,000 distributors, who should be able, he figures, to reach upwards of two million peasants.

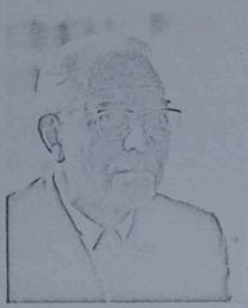
Crucial to the whole scheme would be a generous farm credit program, and either a free market or a government policy on farm prices that would give farmers an incentive to produce.

Dennison sees other consortiums, profiting from example, beginning similar operations in neighboring regions. The participants might well include not only U.S. and Indian partners but European companies (e.g., Montecatini, I.C.I., Dutch State Mines). This should allay Indian suspicions that their country was being invaded by an American "neo-colonialism."

With ten such projects going, India could look forward to its farmers' producing the bulk of the 185 million tons or so of grain the country will need for an adequate level of

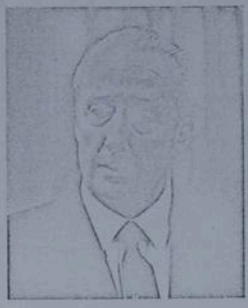
continued page 18

Some Capitalist Doers and Movers

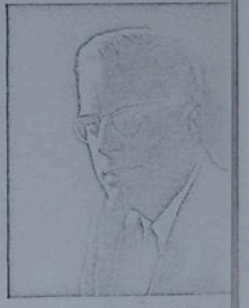


McFARLANE OF CORN PRODUCTS

WILLIAMS, CONSULTANT



DENNISON OF I.M.C.



ALLEN OF HEINZ

These men have some answers to the big problem of putting the underdeveloped nations on their own feet. Alexander McFarlane's Corn Products, while improving the diets of Latin Americans with its processed foods, is providing a cash market for the local farmers. "We're part of the economy," he says. "In a modest way we give the farmer a reason to grow." That is fine as far as it goes, Simon Williams thinks, but U.S. capital must be willing to take bigger risks than it does now. He has one such scheme that would make farmers participants in a corporate setup financed by U.S. and local money. "The opportunity was never better than now," he says, "to experiment with new forms." Charles Dennison is another man with a scheme. He visualizes a consortium of private companies (fertilizer, pesticide, farm-implement manufacturers) drawing all the farmers in a selected geographical area into one mutually advantageous economic unit. Dennison visualizes other consortiums moving in after it and spreading the concepts and methods of the free market across the whole face of India. Among other things, the profit system would give farmers incentives, now sadly lacking in the underdeveloped world. Junius Allen of Heinz can testify to the good effects of incentive. In Venezuela a Heinz plant provided steady employment for the people of a small farm town. "The reactions were marked. Farmers increased their yield and hence their incomes. The average yield of tomatoes doubled in four years."

consumption in 1980. India would then be able gradually to reduce its grain imports while increasing imports of other foods, thus becoming a market, instead of an object of continuing charity, for the U.S.

Dennison has taken his scheme to Secretary Freeman, who thinks it is admirable in concept but questions whether enough attention has been given to "its nuts and bolts." Another government official feels the Indian Government would think twice before letting foreign interests cut such a wide swath into their economy. Dennison himself has told Indian officials: "Here is a scheme. Tear it down or alter it any way you want. But please recognize that it is an attempt to deal with this problem on a scale big enough and fast enough to solve it." His basic motive, he says, is to help the Indians while generating profits for everyone. No one exposed to Dennison's missionary zeal can doubt him.

The unthinkable alternative

There has been a modest marshaling of a variety of public and philanthropic forces on the farms of the world's underdeveloped regions. Besides AID, the United Nations' Food and Agricultural Organization and private foundations, notably the Ford and Rockefeller foundations, are supporting agricultural laboratories and training centers, helping to develop new seed strains and introducing new technologies in farm management. The foundations have sent money and personnel into the Philippines, India, Pakistan, the Middle East, Africa, and Latin America, and have contributed funds to American land-grant universities to enable them to send both advisers and equipment into the foreign field. A typical outlay of Ford Foundation funds was the $300,000 it put up to experiment in crossbreeding West Pakistan's wheat with high-yielding Mexican dwarf strains.

FAO has some 2,000 employees in its Rome headquarters analyzing data and mapping areas from African deserts to Amazon rain forests that might be turned into croplands. And some 2,600 FAO people are in the field in many roles, teaching the techniques of irrigation, helping farmers in their struggles against blight and disease.

But it is the U.S. that can do the most in the struggle because of the power of its capital, if it can be put to work, to fire up the human energy that resides in these populations. It cannot be emphasized enough that this country is unable to fill the food gap, or even supply the fertilizer needs of the Third World indefinitely from its own resources.

Any formula for transplanting capital and the capitalist revolution—Williams', or Dennison's, or anyone else's—will be slow to bear fruit among old and backward cultures. There is little prospect of a short-term profit for American investors, and no one, with the exception of Williams perhaps, is ready to vouch that there will be a sizable long-term profit either.

But American businessmen, singly and in consortiums, and with the support of their government, must face the fact that the world will be unsafe unless economic, as well as political stability, is brought to the countries of the Third World. Food riots that overwhelm all order can turn threats of expropriation or destruction of American properties into reality, so that investment of billions of dollars in oil, mining, and manufacturing may in the end depend very much on a determined movement of American capital into the agricultural economies of those nations. These are practical considerations. They do nothing to lessen the humanitarian involvement in the desperate race between people and food. END

Bibliography, Part 2

UN, Dept of Economic and Social Affairs, PROCEEDINGS OF THE WORLD POPULATION CONFERENCE, N.Y., 1966.

Papers from World Population Conference in Belgrade

Labor force

Aromin, Basilio B., "Population and Labour Force in Selected Countries of Asia and the Far East" (Division of Social Affairs, United Nations Economic Commission for Asia and the Far East) WPC/173.

Ban, Milenko, "Les Aides Familiaux et la Definition de la Population Active" (Ecole Superieure de Statistique, Beograd) WPC/496.

Garfinkle, Stuart, "The Lengthening of Working Life and Its Implications" (Office of Manpower, Automation and Training, U.S. Department of Labor) WPC/15.

Gendell, Murray, "The Influence of Family-Building Activity on Women's Rate of Economic Activity" (International Labour Office) WPC/32.

Ilyina, C.G., "On the Participation of Women in Economic Activities in the USSR" (Deputy Head of Section, Central Statistical Board of the USSR, Moscow) WPC/704/Summary.

Penniment, K.J., "The Influence of Cultural and Socio-Economic Factors on Labour Force Participation Rates," (International Labour Office) WPC/200.

Revankar, G.S., "An Aspect of Global View of Labour Force Growth" (Population Branch, United Nations, New York) WPC/452.

Sinha, J.N., "Dynamics of Female Participation in Economic Activity in a Developing Economy," (Punjabi University, Patiala, India) WPC/285.

van den Boomen, J., "Population and Labour Force Growth in Selected Latin American Countries" (Expert in Demography, United Nations Technical Assistance Operations) WPC/437.

Social policy

Adriasola, Dr. G., Dr. R. Armijo, Dr. H. Behm, and Dra. S. Plaza, "Population Problems in Chile and the Role of the School of Public Health" (Adriasola: MPH, Dean; Armijo: MPH, Prof. Epidemiology; Behm: MP H, Prof. Biostatistics; Plaza: MPH, Prof. Maternal and Child Health) WPC/462.

Avendano, Onofre, M.D., and Anibal Faundes-Latham, M.D., "A Contraceptive Programme in a Latin American Urban Community. Policy, Objectives and Facts" (Avendano: Professor of Obstetrics, State University of Chile, Chief, Obstetrical and Gynecological Unit, Hospital Barros Luco-Trudeau, Santiago, Chile; Faundes-Latham: Instructor in Obstetrics, University of Chile Medical School, Attending Obstetrician-Gynecologist, Hospital Barros Luco-Trudeau, Santiago, Chile) WPC/417.

Blake, Judith, "Parental Control, Delayed Marriage, and Population Policy" (Assistant Professor of Demography, University of California, Berkeley, USA) WPC/153.

Chandrasekaran, C., "Problems of Research Design and Methods in Studies of Effectiveness of Policy Measures Aimed at Influencing Fertility," (Director, Demographic Training and Research Centre, Chembur, Bombay, India) WPC/406.

Gardezi, Hassan Nawaz, "Midwife as a Local Functionary and Her Role in Family Planning: Some Research Findings" (Head, Department of Sociology, Panjab University, Lahore, Pakistan) WPC/355.

Klinger, Dr. Andras, "Demographic Effects of Abortion Legislation in Some European Socialist Countries" WPC/88.

Koya, Yoshio, M.D., "Some Essential Factors for Fertility Control in Japan" (Chairman, Western Pacific Region of International Planned Parenthood Federation) WPC/159.

Mathen, K.K., "The Impact of the M Family Planning Movement on the Indian Population" (M.A., Dr. P.H., All-India Institute of Hygiene and Public Health, Calcutta, India) WPC/345.

Miltenyi, Dr. Karoly, "Social and Psychological Factors Affecting Fertility in a Legalized Abortion System" (Budapest, Hungary) WPC/334.

Miner, Jerry, "Alternative Population Projections and First-Level School Enrollments" (Professor of Economics, Maxwell School of Citizenship and Public Affairs, Syracuse University, Syracuse, New York, USA) WPC/184.

Muramatsu, Minoru, "Policy Measures and Social Changes for Fertility Decline in Japan" (M.D., Dr. P.H., Institute of Public Health, Tokyo, Japan) WPC/60.

Raina, B.L., "Possible Effects of Public Policy Measures on Fertility in India" (Ministry of Health, New Delhi, India) WPC/466.

Economic development and fertility

Clark, Colin, "The First Stages of Economic Growth" (M.A.) WPC/347.

Heer, David M., "Economic Development and Fertility" (Harvard School of Public Health) WPC/85.

Henin, Roushdi A., "Some Aspects of the Effects of Economic Development on Fertility in the Sudan" WPC/280.

Igun, Adenola A., "Demographic Approach to the Problems of Social and Economic Development in Africa" (Chief Statistician and Regional Census Officer, Ibadan, Western Nigeria) WPC/360.

Kosinski, Leszek, "The Demographic Distinctiveness of Recently Settled Areas as Exemplified by the Polish Western and Northern Territories" (Ass. Professor, Dr.) WPC/384.

Leibenstein, Harvey, "The Impact of Population Growth on 'Non-economic' Determinants of Economic Growth" (Professor of Economics, University of California, USA) WPC/95.

Lorimer, Frank, "The Economics of Family Formation Under Different Conditions" (Visiting Professor, University of the Philippines) WPC/306.

Martin, Cyril J., "Demographic Aspects of Capital Formation in Economies with Large Subsistence Sectors (Africa)" (Economist, International Bank for Reconstruction and Development, Washington) WPC/80.

Romaniuk, Kazimierz, "The Demographic Aspects of Economic Growth in Poland" (Professor of Statistics, Central School of Planning and Statistics, Warsaw, Poland) WPC/363.

Szabady, Dr. Egon, "Demographic Aspects of the Changes in the Structure of the Population by Economic Activity in Hungary" (Vice-President of the Central Statistical Office, Hungary) WPC/238.

Fertility - general

Fan, T.H., "Fertility Level and Trends in Taiwan" (Expert, Department of Population, Ministry of Interior, Republic of China) WPC/479.

Gille, Halvor, "Twentieth Century Levels and Trends of Fertility in Developing Countries" (Chief, Office of Social Affairs, United Nations, Geneva) WPC/457.

Roberts, George W., "Fertility" (On behalf of the United Nations) WPC/483.

Thapar, Savitri, "Fertility Rates and Intervals Between Births in a Population in Delhi" (Ph.D.) WPC/258.

Urlanis, B. Ts., "Trends and Factors of Natality in the USSR" (Doctor of Economics, Professor, Senior Scientific Officer, Institute of Economics, USSR Academy of Sciences, Moscow) WPC/247.

Vostrikova, A.M., "Fertility and Methods of Surveying It in the USSR" (Head of the Section of Population and Public Health Statistics, Central Statistical Board of the USSR, Moscow) WPC/464.

Socio-economic factors

Agarwala, S.N., "Effect of a Rise in Female Marriage Age on Birth Rate in India" (Demographic Research Centre, Institute of Economic Growth, Delhi) WPC/18.

Ahmed, Mohiuddin, "Male Attitudes Towards Family Limitation in East Pakistan" (Research Fellow, Department of Demography, Australian National University, and Reader in Economics, University of Rajshahi, East Pakistan) WPC/240.

Carleton, Robert O., "The Effect of Educational Improvement on Fertility Trends in Latin America" (Centro Latinoamericano de Demografia (CELADE)) WPC/152.

Cole, Ansley J., "Factors Associated with the Development of Low Fertility: An Historic Summary" (Princeton University) WPC/194.

Concepcion, Mercedes B., "The Effect of Current Social and Economic Changes in the Developing Countries on Differential Fertility" (Population Institute, University of the Philippines) WPC/491.

Dandekar, Kumudini, "Effect of Education on Fertility" (Gokhale Institute of Politics and Economics, Poona, India) WPC/46.

Das, Nitai Chandra, "A Note of the Effectof Postponement of Marriage on Fertility" (Indian Statistical Institute) WPC/391.

Day, Lincoln H., "Catholic Teaching and Catholic Fertility" (Research Associate, School of Public Health, Harvard University, USA) WPC/202.

El-Badry, M.A. and Hanna Risk, "Regional Fertility Differences Between Socio-Economic Groups in the U.A.R." (El-Badry: Professor of Statistics, Faculty of Economics, Cairo University, United Arab Republic; Risk: Professor of Demography, American University in Cairo, United Arab Republic) WPC/219.

Erickson, E. Gordon, "Changing Virility, Virginity Complexes as Related to Fertility Patterns of Middle Strata Wives: Costa Rica" (Professor of Sociology, The University of Tennessee, USA) WPC/393.

Eversley, D.E.C. and Valerie Jackson, "Problems Encountered in Forecasting Housing Demand in an Area of High Economic Activity: Headship Rates in Relation to Age Structure, Fertility Education and Socio-economic Groups" (West Midlands Social and Political Research Unit, University of Birmingham, England) WPC/154.

Fagley, Richard M., "Doctrines and Attitudes of Major Religions in Regards to Fertility" (Executive Secretary, Commission of the Churches on International Affairs, New York, USA) WPC/92.

Gomez, Carlos J., "Religion, Education and Fertility Control in Latin American Societies" WPC/471.

Goyal, R.P., "Attitude Studies Relating to Family Planning in India" (Institute of Economic Growth, Delhi, India) WPC/218.

Guzevaty, Y.M., "Modern Malthusianism and Problems of Social Development of Liberated Countries" (Candidate of Economic Sciences, Senior Research Worker, Institute of World Economics and International Relations, USSR, Academy of Sciences, Moscow)WPC/188.

Iutaka, Sugiyama, "Inter-generational Mobility and Family Planning in Urban Brazil" (Visiting Associate Professor of Anthropology, The University of Texas, USA) WPC/209.

Kirk, Dudley, "Factors Affecting Moslem Natality" (Director, Demographic Division, Population Council, New York) WPC/434.

Kiser, Clyde V., "Social, Economic and Religious Factors in the Differential Fertility of Low Fertility Countries" (Senior Member, Technical Staff, Milbank Memorial Fund, New York, USA) WPC/82.

Mendoza, Ofelia, Ph.D., "Factores Culturales que Afectan el Control de la Fertilidad en la América Latina" (Field Director, Región del Hemisferio Occidental, Federación Internationl de Planificación de Familia) WPC/421.

Nag, Moni, "Family Type and Fertility" (Superintending Anthropologist, Anthropological Survey of India, Ministry of Education, India) WPC/135.

Namboodiri, N. Krishnan, "On the Problem of Measuring the Strength of Social Norm Concerning Family Size in Underdeveloped Areas" (Reader in Demography, Department of Statistics, University of Kerala, India) WPC/342.

Novett, A., S.J., Ph.D., "Age at Marriage, Parental Responsibility and the Size of the Family" (Darjeeling, India) WPC/30.

Prakasha, Veda, "Education as Preparation for Fertility Control" (Senior Specialist, Institute of Advanced Projects, East-West Centre, Honolulu, Hawaii) WPC/295.

Prothero, Dr. R. Mansell, "Characteristics of Rural/Urban Migration and the Effects of Their Movements Upon the Composition of Population in Rural and Urban Areas in Sub-Saharan Africa" (Senior Lecturer in Geography, University of Liverpool, England) WPC/97.

Raman, M.V., "Attitudes Toward Family Size and Fertility Control in India - An Assessment" (Officer-in-Charge, Demographic Unit, Calcutta, India) WPC/294.

Saffilios-Rothschild, Constantina, Ph.D., "Some Aspects of Fertility in Urban Greece" WPC/XXX 419.

Stycos, J. Mayone, "Education and Fertility in Puerto Rico" (Director, International Population Program, Cornell University, USA) WPC/236.

Sutter, Jean and Hélène Bergues, "Facteurs Sociaux et Psychologiques Influençant le Controle de la Fécondité en Europe" (Sutter: Chef de Service, Institut National d'Etudes Démographiques, Paris, France) WPC/58.

Takeshita, John Y., "Birth Control in Some of the Developing Countries of the Far East" (Population Studies Center, University of Michigan, USA) WPC/309.

Wuellner, Dr. Gabriele, "Effects of Social and Family Patterns on the Population Increases in Togo (West Africa)" (Bonn, Federal Republic of Germany) WPC/42.

Yerushalmy, J., "Religious, Educational, and Socio-Economic Factors Associated with Different Methods of Fertility Control" (Professor of Biostatistics, University of California, Berkeley, USA) WPC/147.

Zikry, Dr. Abdel-Khalik M., "Fertility Differentials of the U.A.R. Women" (North African Demographic Centre, Cairo) WPC/201.

Zimmer, Basil, and Calvin Goldscheider, "A Further Look at Catholic Fertility" (Zimmer: Brown University; Goldscheider: University of Southern California, USA) WPC/171.

Argentina Would Bless Big Population Explosion

By STEWART KELLERMAN
United Press International Writer

BUENOS AIRES—A century ago an Argentine political thinker viewed his country's miles and miles of wilderness and remarked, "To govern is to populate."

Those words of Juan Bautista Alberdi could just as well be said by current leaders who are now hard at work trying to set off a local population explosion.

Other developing nations might pin their hopes for the future on braking population growth, but officials in Buenos Aires believe the key to success is people, people and more of the same.

Argentina is the eighth largest country in the world in area, but only 23 million people inhabit its 1.1 million square miles. To make matters worse, one third live in Buenos Aires, leaving the vast Southern Patagonia and parts of the north empty or underpopulated.

Of even more concern to government planners is the skimpy 1.3 per cent annual growth rate—one of the lowest in Latin America.

"An increase in the quantity and quality of the population is vital for the development of a modern Argentina," says Secretary of State Mario Diaz Colodrero.

In a campaign to stimulate immigration, especially from Europe, the government is laying out a red carpet to attract new Argentines.

Editorial writers call on the government to go all out in competing with Australia, Canada and South Africa for immigrants.

Diaz Coldrero recently announced the latest move in the campaign—plans to allow immigrants to bring in $51,000 in duty-free goods to this country where import levies are extremely high.

However, the calls for more people also reflect concerns in Argentina about big neighbor Brazil, whose population is already approaching 90 million.

Editorial writers point to the 3 per cent growth rate of Brazil and then play a numbers game pegged on the future.

"Argentina and Brazil have traditionally balanced each other in continental power and influence," said the English-language Buenos Aires Herald.

However, the newspaper feels Brazil—with its rapidly growing population — might eventually drown out Argentina's voice in hemispheric affairs.

"In the year 2,000, just thirty years from now, Brazil will be a colossus of 228 million, while Argentina's population will still be a modest 40 million," the Herald estimated.

THE PICK OF Punch

"This is 26 Fernden Avenue, isn't it?"

Rocky Mt. News Mar 6 '69 p 40.

World Food and Population Crisis Seminar--Problems in Tropical Agriculture
Feb. 18, 1969

Give Name

1. My position on these problems.
   a. Accept facts on population
   b. Accept facts and problems of ~~with~~ ethical and moral difficulties
   c. Accept fact that food has to be provided

2. Largest part of problem under gen. heading ecology--total
   a. Very hard work in all biological levels--from basic to applied.
   b.
3. Tropics pose largest numbers of problems. See "Tropical Agriculture, etc.
   a. Difficulties and needs
      1. Temp. zone differs in many respects from tropics:
         Seasonal cycles differ--no winter
         Soils differ--for example erosion of bare soils due to solar influences
         Rainfall patterns very complex
      2. Agriculture different
         large monocultures disastrous consequences.
         very few annual crops

Read, in these connections Anderson, Plants Man and Life, particularly Ch. 9.

      3. Crops ued by tropical lowland people for food largely unknown
         Plantains, tropical yams, sweet potato, manioc, taro, breadfruit
         Many fruits--not commercial, but still major fruit consumption.
      4. Most attention to tropical crops by temperate zone types are those whose products are exported: sugar, coffee, bananas, formerly rubber.
      5. We tend to force temp. zone attitudes, knowledge, and expertise on people unable, unwilling to accept.

4. Rockefeller Foundation as model of successful methods.
   a. Private, committed to long-term efforts
   b. Apolitical--do not represent our government
   c. Motivation--to help people.
   d. Procedures
      1. discover some common area of interest--what food plants people interested in
      2. Develop better varieties for local condition without comment on local morality
      3. Develop education, only as a need is recognized.
      4. Again, no comment on local morality.
   b. Recommendation: if we really want our AID programs to succeed, place funds in such private organization, whose efforts are well founded.

5. Once crop--Manihot esculenta--who knows it?

   a. 5-6th largest producer of calories in low-land tropics
   b. Knowledge about crop equal to corn 100 years ago.
   c. Biologically unknown, likwise its agriculture, its economics
   d. Claimed "bad" by our experts who damn the crop for poor nutrition.
      Lack of knowledge of how it was integrated in native food patterns.

WORLD FOOD AND POPULATION CRISIS SEMINAR

Reading Assignments for February 18

Energy Resources

Brown, Harrison - The Challenge of Man's Future, pp. 149-186.

Brown, Harrison - The Next Hundred Years, pp. 17-26 and 89-113.

Schurr, S. H. - Technology and Economic Development, pp. 70-84.

The World Food Problem - A Report of the President's Science Advisory Committee, Vol. III, Chap. 3.

Ecological Limitations

Bresler, (1967), Environments of Man in Ecosystem, L. Cole (ed.)

Bradley, C. (1962), Human Water Needs and Water Use in America, Science, 138, 489-91.

Thomas, H. E. (1956), Changes in Quantities and Qualities of Ground and Surface Waters in Man's Role in Changing the Face of the Earth, W. L. Thomas (ed.)

The World Food Problem - A Report of the President's Science Advisory Committee, Vol. II, Chap. 7, pp. 407-457.

Odum (1963), Ecology, Energy Flow in Nature's Metabolism, Chap. 3, pp. 37-52; Limiting Factors, Chap. 5, pp. 65-76; Ecological Regulation, Chap. 6, pp. 77-111.

Schaefer, V. J., Artificially Induced Precipitation and its Potentialities in Man's Role in Changing the Face of the Earth, W. L. Thomas (ed.)

Modern Agriculture

Borgstrom, Georg - The Hungry Planet. Read especially Introduction and pp. 1-139 and 344-478. Entire book strongly recommended.

Garst, Jonathan - No Need for Hunger, pp. 1-110.

Future Technology

Nuclear Energy Centers Industrial and Agro-Industrial Complexes, Oak Ridge National Laboratory No. 4290 (November 1968), pp. 1-15 and 165-171

Wang, Daniel I. C. - Proteins from Petroleum, Chemical Engineering, 75, 18 (1968) pp. 99-108.

WORLD FOOD AND POPULATION CRISIS

Problem Assessment

Feb. 4	Overview and organization	(Lewis M. Branscomb) (Jane Bock) (John P. Powelson)
Feb. 11	Fertility, population and food requirements.	(Alice M. Brues) (Roger K. Paget) (R. Hackenberg)
	Nutrition, food production trends.	?(Askell Löve) (Biologists)
Feb. 18	Ecological limitations to food production, land, water, etc. Limiting factors: energy, climatology.	(Meredith Runner) (William Blumen)
	Technological possibilities: modern agricultural technology, food from the sea, synthetic foods, etc.	?(A. Richard Kassander, Jr.)
Feb. 25	Rich and poor: mankind divided. Economic issues: development of capital, international trade, etc.	(Charles Slater) (John P. Powelson) (Carl McGuire)
Mar. 4	Social-cultural limitations, adaptability, etc.	(Elise Boulding) (Alice M. Brues) (Friedl Lang) (T. Graves)
Mar. 11	Organization of study groups Summarizing discussion: contrast of views.	

Small Study Groups

(Thurs.) Mar. 20	H. F. Robinson	
Mar. 25		
Apr. 1	(Spring Vacation)	
Apr. 8	Roger Revelle, Director, Center for Population Studies, Harvard University.	
Apr. 15	(World Affairs Week)	
Apr. 22		

Solutions, Limitations and Prospects

Apr. 29	Population Control: social organization, technical problems, costs.	
	Technological solutions: weather modification; synthetic production of protein and amine acids; irrigation and desalination; food from the sea.	
May 6	Technological solutions: intensive agriculture/ new varieties of pesticides, fertilizer.	
	Behavioral Implications	(Elise Boulding)
May 13	Requirements for capitalization, infra-structure, etc.; transportation, etc.	
	Organizational Implications: Political	(George A. Codding) (Charles Slater)
	World income distribution problem; developing nations' involvement; exchange relations.	
	Unilateral by U.S.	
	International (OECD, UN, etc.)	
May 20	Domestic and international political con-straints	
May 27	Ethical Considerations:	(David Prescott) (Lawson Crowe)
	Cultural distortion	
	Population limitations - race	
	Domestic and international priorities	
	Food and population, and war and peace.	
June 2	Discussion of final report/Evaluation of seminar	

WORLD FOOD AND POPULATION CRISIS _ SEMINAR, FEB. 11, 1969

1. My position in this problem

   Accept facts on population

   Accept facts and problems of ethics

   Necessary to do some work

2. Tropics is where big share of problem lies

   Largest part of problem under general heading ecology - human and other organisms

   Difficulties of study:

   1. Temperate zone differs in many respects from tropics
   2. Agriculture as we know it different
   3. Crops used by tropical lowland people - many unknown to us
   4. We tend to force our attitudes, knowledge, expertise on people unable, unwilling to accept

3. Rockefeller Foundation most successful - their efforts in producing new, improved productive crops not the only value.

   Their work starts with the needs of the people

   People know, use, corn, rice

   Develop these without comment on local morality.

   Develop education, only as a need is recognized

   Again, no comment on what's wrong with local morality

4. One crop - Manihot esculenta - who knows it?

   5 - 6th largest producer of calories in low-land tropics

   Yet, knowledge about it equal to corn 100 years ago

   Biologically unknown, likewise agriculture, economics

   Claimed "bad" by our experts who damn the crop for ppor nutrition

   Lack of knowledge of these experts on how it is used

WORLD FOOD AND POPULATION CRISIS SEMINAR

Reading Assignments for February 11

1. Chapter 20 of Plants, Man and Life by Edgar Anderson - "Rubbish Piles and the Origin of Agriculture"

2. "Tropical Agriculture: A Key to the World Food Crises" BioScience, 19 : 1. Article by H. David Thurston, pp. 29-34.

3. The World Food Problem: A Report of the President's Science Advisory Committee, Vol. 1, pp. 11-24. "Principal Findings and Conclusions"

4. "Population" by Roger Revelle, Science Journal Reprint, October 1967.

5. Population, Evolution, Birth Control, edited by Garrett Hardin, Freeman & Co. First 34 pages.

6. "World Population" by Sir Julian Huxley, Scientific American 194 : 3 reprint, 1956.

7. Williams, George C. (1966) Adaptation and Natural Selection: Chapter 6, Reproductive Physiology and Behavior; Chapter 7, Social Adaptations. Princeton University Press.

8. Harrison, G. A. et al. (1954) Human Biology: Chapter 29, Population Stability. Oxford.

9. Irven De Vore, ed. 1965. Primate Behavior: Chapter 14, The Annual Reproductive Cycle in Monkeys and Apes, by Jane B. Lancaster and Richard B. Lee. Holt, Rinehart and Winston.

10. Eaton, J. W. and A. J. Mayer (1954) Man's Capacity to Reproduce. Human Biology, Vol. 25, No. 3, reprinted by The Free Press, Glencoe, Ill.

11. Geertz, Clifford. Agricultural Involution.

12. McNamara. World Bank Statement. N.Y. Times, Oct. 1, 1968

13. Keyfitz, Nathan. Age Distribution as a Challenge to Development. J. Socio.

WORLD FOOD AND POPULATION CRISIS SEMINAR

Purpose

1. Assess seriousness of the world population explosion and widening gap between rich and poor nations, which are producing diverging requirements for food and its availability in the world; to explore the limitations and possibilities for mitigation of these consequences, and the ethical basis for individual and national responsibility for action.

2. Assess the practicality of an all-University seminar for this purpose.

3. Offer qualified upper division undergraduates an opportunity to come to grips with a pan-disciplinary problem of great complexity but of over-riding human importance within the context of the University's formal educational program.

Output

1. A set of study papers prepared by interdisciplinary groups of students with faculty tutorial assistance dealing with the major facets of the problem. These papers might be edited for publication - in a form yet to be determined.

2. A set of tapes recording the discussions.

3. An annotated bibliography compiled from individual annotated bibliographies submitted by the students.

4. A written critique of the seminar with recommendations for possible future seminars of this type.

Requirements for success: ground rules

1. A high level of individual student initiative and responsibility will be required, in view of the informal structure of the seminar and the absence of a fully structured set of lectures and reading assignments. Homework and self-study will be required!

2. Faculty will have to make a deliberate effort to draw out students and encourage their participation. The final report should be the product of their work to the maximum extent possible.

3. The problem is complex and technical, but is completely rooted in social and ethical considerations that cannot be treated quantitatively. A vast amount of material needs to be covered;

discussion must be disciplined to the central purpose of the seminar. The chairman will have to be tough to (a) keep the discussion practical rather than theoretical, (b) avoid digressions, (c) suppress jargon.

4. Participation in the discussions will be limited to students registered for credit, and to faculty sharing responsibility for directing the seminar. Auditors are welcome subject to this constraint.

SOME RECOMMENDED READING

Bates, Marston - Expanding Population in a Shrinking World, American Library Association (1963).

Bates, Marston - The Prevalence of People, Scribner and Sons, New York City (1955).

HD9000.5* B54 — Borgstrom, Georg - The Hungry Planet, Collier Books, New York City (1967)

GF31 B68 — Brown, Harrison - The Challenge of Man's Future, Viking Press, New York (1956)

Day, Alice Taylor and Lincoln H. - Too Many Americans, Dell Publishing Company, New York City (1965)

Greep, R. - Human Fertility and Population Problems (1963)

On order at bookstore — Hardin, Garrett (ed.) - Population, Evolution, Birth Control, W. H. Freeman and Company, San Francisco and London.

Hauser, Philip M. (ed.) - The Population Dilemma, the American Assembly, Prentice Hall, Englewood Cliffs, New Jersey (1963).

Knopf, Alfred A. - Technology and Economic Development, A Scientific American Book (1963)

HN683 L4 — Lewis, Oscar - Village Life in Northern India, Vintage Books, No. V-284, Random House, New York (1958).

HB861* E7 — Malthus, Thomas Robert - On Population, Modern Library, No. 309, New York.

Malthus, Thomas, Julian Huxley, Fredric Osbord - On Population, The New American Library (1960).

Millikan, Max and David Hapgood - No Easy Harvest, Little, Brown and Company, Boston (1967)

HB885 M8 — Mudd, Stuart, (ed.) - The Population Crisis and the Use of World Resources, Bloomington, Indiana University Press (1964).

HC412* M9 — Myrdal, Gunnar - Asian Drama: An Inquiry into the Poverty of Nations, 3 volumes, Pantheon (Random House), New York (1968).

HD9000.5 P22 — Paddock, William and Paul - Famine - 1975! Little, Brown and Company, Boston (1967)

Paddock, William and Paul - Hungry Nations, Little, Brown and Company, Boston (1964)

Peterson, William - Population, Macmillan, New York (1961)

Revelle, Roger - Can the Poor Countries Benefit from the Scientific Revolution? (mimeographed manuscript)

Revelle, Roger - International Cooperation in Food and Population, Harvard University Center for Population Studies, Contribution No. 39.

HC59* Z453 — Zimmerman, L. J. - Poor Lands, Rich Lands: The Widening Gap, Random House, New York.

Z7164
D3P83
Ref. Dept.

Office of Population Research - Population Index, Princeton University Press, Princeton, New Jersey.

Scientific American offprints (20¢ each):

192 - Wynne-Edwards - Population Control in Animals

608 - Deevey - The Human Population

609 - Dobzhansky - The Present Evolution of Man

616 - Huxley - World Population

621 - Berelson and Freedman - A Study in Fertility Control

Food and Agriculture Organization of the United Nations, Calorie Requirements, FAO Nutritional Studies, No. 15, Rome, 1965.

World Health Organization, Protein Requirements, Report of a joint FAO/WHO Expert Group, World Health Organization Technical Report Series No. 301, Geneva, 1965.

The White House Department of Interior Panel on Waterlogging and Salinity in West Pakistan, Report on Land and Water Development in the Indus Plain, January 1964.

National Academy of Sciences/National Research Council, Pre-School Child Malnutrition. NAS/NRC Publication No. 1282, 74 pp. Washington, D.C. 1966.

U.S. Government Printing Office, Washington, D.C. 20402 - The World Food Problem, A Report of the President's Science Advisory Committee, Panel on the World Food Supply. Superintendent of Documents.

DAEDALUS - Historical Population Studies, Journal of the American Academy of Arts and Sciences, Spring 1968, American Academy of Arts and Sciences, 280 Newton Street, Brookline Station, Boston, Mass 02146.

Chamber of Commerce of the United States, - The Metropolitan Enigma: Inquiries into the Nature and Dimensions of America's "Urban Crisis" - 1615 H Street, N.W., Washington, D.C.

BioScience, July 1968, January 1969 - Articles by McElroy, Cole, Archer, Predmore and others.

Science, 162, 1243 (1968) - The Tragedy of the Commons, G. Hardin.

Science, 158, 730 (1967) - Population Policy: Will Current Programs Succeed? K. Davis

WORLD FOOD AND POPULATION CRISIS

Problem Assessment

Feb. 4	Overview and organization	(Lewis M. Branscomb) (Jane Bock) (John P. Powelson)
Feb. 11	Fertility, population and food requirements.	(Alice M. Brues) (Roger K. Paget) (R. Hackenberg)
	Nutrition, food production trends.	?(Askell Löve) (Biologists)
Feb. 18	Ecological limitations to food production, land, water, etc. Limiting factors: energy, climatology.	(Meredith Runner) (William Blumen)
	Technological possibilities: modern agricultural technology, food from the sea, synthetic foods, etc.	?(A. Richard Kassander, Jr.)
Feb. 25	Rich and poor: mankind divided. Economic issues: development of capital, international trade, etc.	(Charles Slater) (John P. Powelson) (Carl McGuire)
Mar. 4	Social-cultural limitations, adaptability, etc.	(Elise Boulding) (Alice M. Brues) (Friedl Lang) (T. Graves)
Mar. 11	Organization of study groups Summarizing discussion: contrast of views.	

Small Study Groups

(Thurs.) Mar. 20	H. F. Robinson	
Mar. 25		
Apr. 1	(Spring Vacation)	
Apr. 8	Roger Revelle, Director, Center for Population Studies, Harvard University.	
Apr. 15	(World Affairs Week)	
Apr. 22		

Solutions, Limitations and Prospects

Apr. 29	Population Control: social organization, technical problems, costs.	
	Technological solutions: weather modification; synthetic production of protein and amine acids; irrigation and desalination; food from the sea.	
May 6	Technological solutions: intensive agriculture/ new varieties of pesticides, fertilizer.	
	Behavioral Implications	(Elise Boulding)
May 13	Requirements for capitalization, infra-structure, etc.; transportation, etc.	
	Organizational Implications: Political	(George A. Codding) (Charles Slater)
	World income distribution problem; developing nations' involvement; exchange relations.	
	Unilateral by U.S.	
	International (OECD, UN, etc.)	
May 20	Domestic and international political con-straints	
May 27	Ethical Considerations:	(David Prescott) (Lawson Crowe)
	Cultural distortion	
	Population limitations - race	
	Domestic and international priorities	
	Food and population, and war and peace.	
June 2	Discussion of final report/Evaluation of seminar	