AGRICULTURE

Man's Chance to Prevent Famine

A U. S. soil expert has a plan to make underdeveloped countries more fruitful through better agriculture. Reclaiming eroded soil is key to future, Watson Davis reports.

➤ A NEW "DOWN TO EARTH" approach to making many areas of the earth more fruitful and more satisfactory for living is being advocated by one of the great pioneers in utilization and care of the land.

He is Dr. Walter C. Lowdermilk, now a young 72, for many years a leader in soil conservation in the United States Department of Agriculture and for the last 12 years since he "retired" consultant to various countries throughout the world for the Food and Agricultural Organization of the United Nations.

Better agriculture, decentralized small industries, and betterment of living in villages are the three central objectives of Dr. Lowdermilk's plan. His program has been worked out as a result of understanding and studying the conditions of subsistence agrarian economies that make up two-thirds of mankind now on the threshold of industrialization.

Even where the cooperation between various nations has been limited by war and strife, Dr. Lowdermilk has made substantial progress in reclaiming land that was all but destroyed by natural forces set in motion by human disuse. His experience in reclaiming the land is giving civilization a chance to win what Dr. Lowdermilk calls "a race with famine."

Population Increase a Challenge

The accelerating explosion of human population, already reaching serious proportions among the less developed nations of the world, is a tremendous challenge to statesmen, scientists, technologists and farmers of today.

Despite the embarrassing food surplus of the United States, created by the application of scientific agriculture, about two-thirds of mankind has neither learned nor practiced modern agriculture. Subsistence or peasant farmers are tilling the soil in much the same way that their ancestors did in the past centuries.

While there is what Dr. Lowdermilk calls "a revolution of rising expectations," about two-thirds of mankind are undernourished, poorly clothed and inadequately housed. Emerging new states have gained political freedom but are still not free from privations and want.

After the devastating famine in China in 1920-21, Dr. Lowdermilk studied in Asia the conditions that cause famine. He came to the realization that there is no substitute for food. In widespread hunger, people come to the realization that the life of nations rests upon food.

Only when there is more food produced than the farmers themselves require are other human beings released for enterprises in the industrial world and the services that make up a modern society.

The very real and practical laboratory, which Dr. Lowdermilk has studied as a soil scientist, has been such areas as the Far East, Middle East, Africa and the United States. Most recently he has applied his knowledge to the modern state of Israel where amazing results have been achieved in creating a new agriculture to rescue man-made deserts.

In reclaiming the land, and causing it to bring renewed fruitfulness, it must be understood how water works to destroy and the way that soils and waters can be conserved. Years of experimentation on the land itself with extensive projects have allowed Dr. Lowdermilk and his fellow experts to manage the land and save it for the future.

Making the furrows of fields follow the contour of the land, with supporting measures, is the most important factor in restoring the land that has been eroded by rain. Human devotion to moving and plowing in straight lines allows running waters to ravage the land. Gullied areas of cultivated land become devastated and lost to agriculture.

Careful attention to how the land can be made to preserve itself and repair itself, by contour farming, is the method used to restore ruined land. At this agricultural surgery, Dr. Lowdermilk is a past master.

In the redemption of the fruitfulness of the earth, Dr. Lowdermilk sees the farmer as the key person who in an understanding community will have a place of importance and honor. In a nation like Israel, where there is high motivation, the farmer is receiving recognition. Youth is less attracted to white-collar jobs and willing to work at productive skills and trades.

Dr. Lowdermilk feels that in most developed states of the world this direction can be given to youthful ambitions. Only with such foundations of agriculture alone can reclamation of the land be achieved.

Agricultural science now knows how land became worn and damaged and what needs to be done to bring it back to useful agricultural production.

Suggests Valleys or Drainage Basins

For the new agricultural developments that will bring self-support to an area, Dr. Lowdermilk suggests valleys or drainage basins as the units of operations. People will have a special interest in the hills and valleys that support them. The land they live on is sacred to the people. It is there that they will learn new skills and apply them for themselves, their children and their children's children.

Because tradition among farmers of less developed peoples is strong, persons who work the land are more skeptical and more demanding. The traditional farmer will support modern ways, Dr. Lowdermilk has

CONTOUR FARMING RECLAIMING LAND—Agricultural areas undergo erosion initiated by cultivation of small patches of land. This is a scene in the northern Negev of Israel where Dr. Lowdermilk applied his methods of saving the land.

found, only when he has the approval and support of farmers in his community. The farmer and his neighbors must be convinced that the new ideas will actually work.

Pioneer projects would consist of drainage basins of suitable size and with features that careful surveys show would be likely to produce successful results. Staffs of experts, an able director, and a consulting board would operate the project. The area to be included would not be large or too small but limited to a size that its inhabitants can know firsthand.

There would be three objectives:

1. Improvements in the method of agriculture that would result in greater produciton per crop, per unit area farmed and per man.

2. As manpower is released by this more productive agriculture, suitable decentralized industries would be created to take up this extra manpower.

3. Emphasis upon improvements in the villages and better transportation which would make life more pleasant and more efficient. Medical facilities, better water supply, better sanitation and better schools would follow along with the improved agriculture and decentralized industries.

If this kind of development can be gotten underway, Dr. Lowdermilk feels sure that there will be a renaissance in the agricultural civilization necessary to support the people of the earth.

He has an abiding confidence in the ability of peoples even in what are considered backward countries. He is fond of telling how he found that in a West Africa country teachers from a well-developed European country assumed that native Negro children knew nothing.

Dr. Lowdermilk found, however, that practically every child by the age of 12 knew all the plants in his village by name. They did not know the botanical classification, of course. But each child could identify and tell whether the plants were poisonous or good to eat. This keenness of observation and this knowledge that came down from their surroundings and their families were impressive.

With such native ability, and with the newer knowledge simply and practically taught and integrated, Dr. Lowdermilk believes that these areas will be well on their way toward social and economic self-sufficiency.

Practical measures that work are of great importance in land and water conservation, utilization and reclamation. But for their continuous application, Dr. Lowdermilk observes that people of each nation must accept a moral responsibility for the good earth that not only feeds the present population but must feed the generations which are to come.

Land, in his view, is not just an economic commodity. It is a part of a nation even as its people are. Dr. Lowdermilk's conviction is that the food supply and the condition of land determines whether a nation rises, maintains itself or falls.

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MEDICINE

Mushroom Drug for Cancer

➤ AN ANTITUMOR agent, calvacin, has been found active against 14 various types of cancer and is now being prepared for clinical trial, probably within six months.

Calvacin, extracted from the fruiting bodies, or sporophores, of the giant puffball mushroom, *Calvatia gigantea,* is a "non-diffusible, basic mucoprotein." This type of drug is not now available for treating malignant tumors.

The first clue to the tumor-stopping ability of calvacin was discovered several years ago by a Michigan State University team headed by the late Dr. E. H. Lucas.

Since that time, MSU workers have screened hundreds of *C. gigantea* strains to find those that produce the most calvacin in the shortest time.

Scientists at Armour and Company, Chicago, isolated the calvacin from the sporophores and developed the fermentation process.

A third group at Sloan-Kettering Institute for Cancer Research, New York, tested the drug against 24 types of mouse, rat and hamster tumors. In 10 types of tumors, the drug prevented growth beyond a size one-fourth to three-fourths that of the control animals not given the drug. In four types of tumors, calvacin stopped the growth at one-fourth the size of the controls. In one type of cancer, the drug was toxic to the animal.

Dr. C. Chester Stock of Sloan-Kettering's team said calvacin was scheduled to be on clinical trial by now, but difficulties in the fermentation process indicate that the drug will have to be extracted from the fruiting bodies instead. If all goes well, calvacin will go on clinical trial in New York by mid-1961.

The research was reported in Science, 132:1897, 1960, official journal of the American Association for the Advancement of Science, by Drs. J. F. Roland, Z. F. Chmielewicz, B. A. Weiner, A. M. Gross, O J Boening, J. V. Luck, all of Armour and Company, and Dr. T. J. Bardos, formerly with Armour, now at the University of Buffalo, N. Y., also Drs. H. Christine Reilly, K. Sugiura and Dr. Stock of Sloan-Kettering; and Dr. Lucas, R. U. Byerrum and J. A. Stevens, all of MSU in East Lansing, Mich.

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Do You Know

The first traces of *navigation* ever discovered, wooden oars found on the coast of Denmark, date back to about 7000 B.C.

There are about 26 trillion *cells* in a human body.

In the world as a whole, three *babies* are born every second.

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