

TECHNOLOGY

Preserves Perishables

► A METHOD of preserving food which will make available fresh fish in areas far from the sea and fresh tropical fruit out of season is close to commercial testing.

Dr. Paul C. Aebersold, director of the office of isotopes development of the United States Atomic Energy Commission, Washington, D. C., told the Tenth Pacific Science Congress in Honolulu that mild doses of radiation can be used to reduce the growth of bacteria for weeks in perishable foods. This promises to compete with canning and frozen food in the near future.

The "low dosage" preservation of food, also known as radiation pasteurization, promises to be particularly important in the event of limited wars in which United States troops may be engaged in the future. Soldiers in the front line areas could be supplied with otherwise perishable foods without refrigeration.

An immediate commercial application is used on strawberries, which can be prevented from molding for weeks by low-level radiation. The radiation is cheaply and simply available from some of the by-products of atomic reactors.

In India tests have shown that the ripening of mangoes can be delayed and this tropical fruit, usually not available to areas without refrigeration, can be made available widely in the future. Since for religious reasons, meat is not widely eaten in India and mangoes have excellent protein and nutrient qualities, this should be a major contribution to the Indian diet.

Another advantage of low dose preservation is that any larvae of dangerous insects

would be killed by this method. For that reason fruits that otherwise could not be shipped into areas like the United States would be made safe for marketing.

For radiation pasteurization, a few thousand rads are necessary, which is only about one-tenth to a hundredth of the more massive radiation doses used in the food sterilization that the U. S. Army Quartermaster Corps is investigating. A rad is a unit measuring radiation somewhat similar to roentgens which are used to measure X-ray dosage. A rad produces 100 ergs of radiant energy per gram of the material being irradiated.

The apparatus for irradiating food probably in the future will be used in the food processing plants or even in the fields where the crops are being harvested.

The Atomic Energy Commission is undertaking a five-year study of this new food preservation method and experiments are underway at the Massachusetts Institute of Technology, Cambridge, Mass., at Seattle, and at the University of California Agricultural Experiment Station at Davis.

The low-dosage irradiation supplements the work the U. S. Army Quartermaster Corps is doing at Natick, Mass., on high dosages of radiation capable of completely destroying bacteria, permitting food preservation without refrigeration for many months and years. Although this food sterilization program is progressing more slowly than was expected when it was introduced a few years ago, it is still a major food research project of the Army.

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door recreational facilities shortages, and other unhappy situations.

In the longer run, in less than 800 years, a continuation of present U. S. growth rate would result in there being a person to every square foot of land in the nation. While 800 years is a long time to an individual, it is only an instant in the evolutionary development and a relatively short time in the life of the nation, Prof. Hauser observed.

The United States will have a total population of one billion persons by 2050 if present rates continue. Prof. Hauser declares that the United States cannot safely maintain indefinitely its present national rate of increase, which doubles the population in about every 40 years.

The United States has however, already gone a long way toward controlling its rate of population growth. The birth rate since World War II is only half of the U. S. birth rate in 1800. However, decreases in death rates have been so spectacular that the halving of the birth rate is not enough to prevent continued explosive growth. A further decrease in the birth rate of about 40% would produce a stationary population.

The underdeveloped areas of the world face even more severe consequences since they have yet to begin the process of effective fertility control.

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Insects Kill Weeds

► THE INSECT enemies of unwanted weeds are doing an excellent job in clearing areas for agriculture. The U. S. Department of Agriculture is expanding research to release more insect enemies of undesired plants.

James K. Holloway, entomologist in the U. S. Department of Agriculture's Agriculture Research Service, Berkeley, Calif., reported to the Tenth Pacific Science Congress in Honolulu that the insect attack upon weeds began in 1944 when the U. S. Department of Agriculture and the University of California cooperated to import insects to control St. John's-wort (Klamath weed).

Imported beetles cleared more than a half million weed-infested acres in California and the Northwest. This stimulated attempts to control other weeds with insects.

The gorse seed weevil, *Apion ulicis*, was liberated in 1953-54. It became established and subsequently has become a factor in retarding the spread of furze.

The cinnabar moth, *Tyria jacobaeae*, was introduced in California in 1959 to control tansy ragwort. The moth became established there and in Oregon, where substantial numbers were released the following year, Mr. Holloway said.

In 1960, the twig mining moth, *Leucop-tera spartifoliella*, was released in an effort to regulate the growth and retard the spread of Scotch broom. This insect became established, and additional releases were made this year.

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VITAL STATISTICS

U. S. Population Dangers

► THE POPULATION explosion in the United States now in progress in the next few years will bring dangerous consequences to which the nation is "blinded by the short-run gains of resurgence in national growth," Prof. Philip M. Hauser, director of the University of Chicago's Population Center, told the Tenth Pacific Science Congress in Honolulu. Following an increase of 75 million persons during the first half of the century, present trends indicate an increase of more than 230 million persons during the second half of this century, an increase which alone surpasses the 179.3 million persons in the United States at the present time.

Prof. Hauser's warning of rapid population growth to the nation included:

1. Inundation of the schools, with a reduction in the quality of education.

2. Slum-like congestion, air pollution, water contamination and shortages, and commuter problems in the metropolitan areas.

3. Chronic unemployment as postwar babies enter the labor force at rates that

challenge the capacity of the economy to absorb them.

4. An increase for the first time in United States history of more people to feed than productive workers.

5. Obsolescence of the old forms of local government, intensification of conflict between cities and rural areas, and increased governmental intervention in our way of life.

6. Greater frictions and tensions in urban living brought about by a quickened tempo of social and cultural change.

7. Increased delinquency, crime, drug addiction and divorce, which indicate increased personal and social disorganization.

8. Increased friction between groups in the population, particularly white-Negro relations and a retarding of the effort of the Negro to raise his economic and social status due to the explosive increase of Negro population which exceeds that of the white.

In addition to these short-run dangers, Prof. Hauser sees the prospect in the future of mineral scarcities, water shortages, out-