

## NUTRITION

# Go Deep for Food

**An unexplored layer in the ocean may be the source of undreamed of quantities of food. Sawdust and ocean fish farms will be sources of food for the hungry.**

► **PILES** of sawdust, "fish farms," or unknown creatures which live in a mysterious, echo-bouncing layer in the ocean's depths, all may some day help to feed a hungry world.

Great masses of tiny green algae could be cultivated as a new form of fresh water food. New hybrid plant varieties could greatly boost the vital output of farmers everywhere, from America's corn and wheat belt to Chinese rice paddies or tropical sugar cane plantations.

These are all serious possibilities for increasing the world's future food supply, four scientists reported to the American Philosophical Society in Philadelphia, Pa.

Pilot plants are already in operation converting material with little or no food value—sawmill residue, the evil-smelling wastes from wood-pulp mills and cast-off parts of agricultural crops—into digestible sugars, proteins and fats, Dr. Alfred J. Stamm, research chemist of the U. S. Forest Products Laboratory at Madison, Wis., said.

Next to soybean meal, yeast foods made from wood sugar molasses appear to be the cheapest source of proteins in the world, he said. Proteins are among the major foundation stones of human and animal nutrition.

From a ton of wood waste, a ton of sugar-rich molasses can be produced by a Forest Service process developed during World War II, Dr. Stamm reported. This molasses is palatable to cattle but not to humans. However, the bitterness (much like blackstrap molasses) can be removed by filters or by crystallizing out pure dextrose sugar.

From wood molasses, Dr. Stamm said, a protein livestock feed high in vitamins can be produced by growing yeasts and molds on the sugar. These yeasts compare favorably in food value with baker's and brewer's yeasts.

Dr. H. A. Spoehr, emeritus chairman of the division of plant biology of the Carnegie Institution of Washington and consultant to the Secretary of State, told of current experiments in growing a form of fresh water algae, the chlorellas, as another source of proteins and fats.

Dr. Merle T. Jenkins, plant scientist for the U. S. Department of Agriculture, said tremendous gains have already been achieved in the yields of farm crops by introduction of hybrid strains.

Examples he cited: Wheat output has gone up 20% in 25 years in South Dakota; hybrid corn has boosted acre yields by at least 25%; Japanese rice production has

gone up 70% in the past 65 years; Maine is growing 75% more potatoes per acre than 20 years ago; hybrid strains have doubled the yield of sugar cane in Java in 30 years.

It is fish and other foods from the oceans, however, which may ultimately have to feed expanding populations in areas of the world where there is not enough to eat, Dr. L. A. Walford, chief of fishery biology in the U. S. Fish and Wildlife Service, wrote in a paper which was read in his absence.

In the immediate future, he said, cultivation of fish like farm crops, growing them in artificial ponds, in rice paddies, in man-

made lakes back of dams or in irrigation ditches "can be a most fruitful way of improving the supply of protein foods."

But in the ocean, Dr. Walford reported, "there is an unknown thing, still unexploited, still unexplored, which may prove to be an extravagantly large food resource." This is what scientists now call the "deep scattering layer."

During World War II, echo sounding instruments discovered a layer of "something" between the surface and the bottom, everywhere in the ocean. Sometimes there was more than one such layer. Scientists who have studied the phenomenon, Dr. Walford said, agree that it is caused by masses of living organisms. But because nets do not exist which can be used at the great depths where the layer occurs, what these organisms are remains unknown.

"The least result to be expected from research into the deep scattering layer would be the extension of human knowledge about the earth," Dr. Walford wrote. "The most practical result might be undreamed-of quantities of food."

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## AGRICULTURE

## Natural Rubber Reserve

► **JUST** as in the first days of World War II, the Government is again showing interest in a scraggly desert plant called guayule. The reason: Guayule produces rubber—natural rubber—and it can be grown in the United States.

Scientists of the Department of Agriculture have announced they have succeeded in breeding new hybrid strains of the plant which yield 25% to 40% more rubber than the World War II variety.

Work on guayule has been going on at



**UP THROUGH THE HATCH**—The Air Force H-12, new multi-purpose helicopter, effects a rescue from a life raft. The man is brought directly into the cabin of the helicopter by an inside hoist.

Salinas, Calif., since 1942—the year the Japanese cut the U. S. off from the natural rubber plantations of the Far East. Then, a few weeks after Pearl Harbor, Congress authorized 32,000 acres of guayule planting in California as an emergency source of rubber.

Not much rubber was obtained. It took until 1944 for the first plants to be harvested and the cost per pound of guayule rubber was very high. Synthetic rubber was developed meanwhile to meet America's need.

But the research on guayule continued. The Agriculture Department believes the plant may some day be grown profitably on some 2,000,000 acres of dust-dry land in Texas.

Test plantings have been carried out with the aid of the Texas Agricultural Experiment Station. Other plantings have been made in California on Government-owned range land.

One of the new hybrids developed by the scientists is reported to breed true from seed and to carry first-generation vigor into succeeding generations. It is believed that seedlings of the productive new strains will produce about 1,200 pounds of rubber per acre in five years of growth.

Guayule will probably never supply all the natural rubber this country needs. But with the tropical rubber belt of Indonesia and Malays under increasing Communist pressure, the U. S. is once again eyeing this desert shrub as a possible "living reserve" of rubber here at home.

Science News Letter, November 4, 1950

#### GENERAL SCIENCE

### UNESCO Gift Stamps Help Teach Science Overseas

➤ YOUR quarter can help send film equipment or medical and scientific books to institutions in countries that cannot now buy these and other needed educational

materials because of their dollar shortages.

A plan by which school children, youth groups, adult organizations and all others can contribute to reconstruction overseas is being discussed in Washington. Known as the UNESCO Gift Stamp program, small contributors would buy stamps toward the purchase of \$10 gift coupons. These gift coupons are now being used to buy books, films and other educational, scientific and cultural supplies for countries overseas.

The United Nations Commission for UNESCO states in Washington that the Gift Stamps are expected to be available after the first of the year.

Specific projects for which the money may be used include equipping school laboratories, buying movie projectors for mass education campaigns, sending medical and scientific books to schools and professional societies and training programs for technical personnel in underdeveloped countries.

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#### ZOOLOGY

### Losses Cut 75% with Rat Control Measures

➤ WITH warfarin, a new rat-killing poison, and with other new anti-rodent "ammunition," the U. S. Fish and Wildlife Service believes the nation's annual loss to rats and mice can be cut by at least 75%.

On one dairy farm alone, warfarin killed 1,400 rats in two months, Walter W. Dykstra, rodent control official of the Fish and Wildlife Service, told the National Pest Control Association in Cincinnati.

Warfarin is a slow-acting poison which causes internal hemorrhages in housemice or rats, even if only a very small amount of it is consumed. And animals do not know they've been poisoned after eating warfarin bait; they keep coming back for more until they die.

Other tricks to keep away rodents and bird pests: Stringing charged wires along building ledges and over doorways to create an electrical field which will shock pigeons or starlings. And sending out high-frequency sound waves, above the audio limit of the human ear, to scare away both birds and rats and mice. This method, said Mr. Dykstra, has even caused rats to jump overboard from ships.

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## Question Box

#### ENTOMOLOGY

When does one use a hammer to kill a fly? p. 297.

#### ICHTHYOLOGY

What function do the starfish feet perform besides "walking"? p. 302.

#### GENERAL SCIENCE

How do gift stamps help to teach science? p. 292.

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#### MEDICINE

What do the six new strains of influenza have in common? p. 295.

What infections does a digestive enzyme now fight? p. 296.

What kind of banks beside blood banks may soon become popular? p. 296.

What organ of the body can stand in for a missing stomach? p. 293.