BACTERIOLOGY

New Germ-Fighting Tactics

Bacteria are "smothered" to death with weed-destroying 2,4-D and viruses are subjected to the shattering vibrations of intense sound.

➤ "SMOTHERING" bacteria to death with 2,4-D, popular war-born weed-killer, and shattering viruses with intense sound waves are the latest steps in man's war against germs as reported by two groups of investigators in the journal, *Science* (July 2).

No immediate practical application is suggested in either report. But the work adds to knowledge which may lead to better methods for fighting disease germs.

The way 2,4-D, which is really a plant hormone or growth regulator, kills some kinds of plants is not definitely known. It has been thought to interfere in some way with plant respiration, or breathing. Bacteria which require free oxygen for their breathing are "smothered" by 2,4-D, report Drs. Winfield A. Worth, Jr., and Anne M. McCabe of Duke University School of Medicine. They react similarly to germinating barley seeds, which are stopped by the chemical. But bacteria that cannot live with free oxygen, including such deadly ones as the germs of tetanus, gas gangrene and botulism, are not affected to any significant degree by 2,4-D.

Viruses that prey on bacteria, such as the bacteriophages, were subjected to the shattering vibrations of intense sound. Electron microscope studies showed that the ones that were resistant to the intense sound waves were all small sphere-shaped viruses. The ones disintegrated by the vibrations were relatively larger, tadpole-shaped viruses with more complex structure and frequently with pointed heads. These studies were made by Drs. Thomas F. Anderson, Shiela Boggs and Betty C. Winters of the University of Pennsylvania under a contract with the Navy and supported partly by a grant from the Raytheon Manufacturing Company whose magneto-striction sonic oscillator was used.

Science News Letter, July 10, 1948

GENETICS

Corn May Fight Pellagra

➤ PELLAGRA, hard-times disease among cornmeal-eating peoples, may some day be combatted with the very grain that is now blamed as its chief cause. Possibility of producing strains of hybrid corn with high content of niacin, the pellagra-preventing vitamin, is pointed out in *Plant Physiology* (April) by Dr. Frederick D. Richey of the U. S. Department of Agriculture, who works at the Tennessee Agricultural Experiment Station in Knoxville, and Dr. Ray F. Dawson of Columbia University.

A preliminary survey showed that the niacin content of different existing strains of corn is highly variable. Dr. Richey's own breeding experiments confirmed this, with niacin content in different lines ranging from less than 14 parts per million by weight to one exceptional inbred line that ran somewhat better than 53 parts per million. He was able to build up one hybrid that consistently had a niacin content well over 40 parts per million.

Drs. Richey and Dawson conclude that corn hybrids with niacin concentrations as high as 50 parts per million can be developed.

That does not necessarily mean, however, that such hybrids are going to be developed, because other factors have to be taken into account. Such readily recognizable qualities as high yield per acre, sturdiness of stalk, and resistance to drought, diseases and pests are not likely to be sacrificed for the sake of an invisible improvement in the vitamin content of the grain. Individual farmers have individual preferences, which do not always have much to do with the intrinsic value of what they plant. And since different parts of the country have marked climatic and soil differences, the difficult job of producing a high-niacin hybrid would have to be done not once but several times.

Dr. Richey, a pioneer leader in the cooperative research program that gave hybrid corn to American agriculture, was recently given the U. S. Department of Agriculture's Distinguished Service Award.

Science News Letter, July 10, 1948

BOTANY

Irradiated Seed Deforms

➤ ATOM-BOMB RAYS powerful enough to kill men or animals, released at the first Bikini burst, failed to kill grains of seedcorn exposed on the decks of the target ships, but did cause them to produce plants with many defects and abnormalities. First results of these experiments are described in detail in *Science* (July 2), just two years and one day after the burst, by Drs. L. F. Randolph, A. E. Longley and Ching Hsiung Li, Cornell University botanists.

Two kinds of seedcorn were used in the tests, one a single-cross hybrid field corn, the other an inbred sweetcorn strain. Twenty-five packages, each containing from 1,500 to 2,500 grains, were exposed on ships in the target array, at varying distances from the center of burst. Similar lots were exposed to graded X-ray doses, from 5,000 to 25,000 Roentgen units. Finally, samples of both kinds of seed were kept untreated, for planting as controls.

As soon as the irradiated seed had been returned from Bikini, portions were planted at the U. S. Department of Agriculture experiment station at Beltsville, Md. Other plantings were made at the experimental farm of the California Institute of Technology, with all three groups of seeds included.

The untreated control seed produced plants of the uniform types expected of corn bred by modern methods. Both the Bikini seed and the X-rayed seed produced many abnormal plants. Some of these had twisted, crinkled, diminutive or otherwise deformed leaves. Other leaves, normal in size and shape, had areas lacking chlorophyll, the green food-making substance, or else completely dead spaces which often resulted in lengthwise splitting.

Tassels also were aberrant, producing as much as 50% of dead or otherwise abnormal pollen. Microscopic examination disclosed derangements and partial destruction of many of the heredity-controlling chromosomes in the cells.

X-rayed seed exposed to doses of between 10,000 and 15,000 Roentgens produced plants most nearly resembling those that came from the Bikini seed, although the similarities did not amount to identity.

Science News Letter, July 10, 1948

AERONAUTICS

Guggenheim Medal Goes To Aircraft Engineer

➤ THE prized Daniel Guggenheim Medal, given annually for achievements in aeronautics, has been awarded for 1948 to Leroy R. Grumman of the Grumman Aircraft Engineering Corporation, Plandome, Long Island. As recipient, Mr. Grumman takes a place along with Orville Wright, Glenn L. Martin, Donald W. Douglas, Juan T. Trippe, Lawrence D. Bell and other notables in aviation accomplishments.

The selection of the recipient of this medal each year is made by a board of 21 persons, including those formerly honored, together with representatives of the American Society of Mechanical Engineers, the Society of Automotive Engineers, the Institute of the Aeronautical Sciences and the United Engineering Trustees.

Advanced aircraft design both for Naval and civil use earned Mr. Grumman the medal.

Science News Letter, July 10, 1948