

PUBLIC HEALTH

Fear of Genetic Effects From Fallout Exaggerated

► THE GENETIC CONSEQUENCES of fallout from nuclear bomb-test explosions and the injury and damage that may result to unborn generations is of growing public concern.

"But these fears may be exaggerated," Dr. Richard Caldecott, geneticist of the U.S. Atomic Energy Commission, told SCIENCE SERVICE.

"In a long-term study made of a group of survivors of the Hiroshima and Nagasaki bombings and an unirradiated control group of the same age and physical characteristics and similar environment, there have been no more malformations in the progeny of the irradiated group than in those not exposed to the atomic bombs," he noted.

There are two possible reasons for this absence of detectable genetic effects, according to Dr. Caldecott. One is that the doses of radiation to which the survivors were subjected were so low as to result in imperceptible increases in genetic damage. The other is that many of the genetic changes that would be induced by irradiation could take several generations before they became detectable.

In other words, damage is more likely to be detected if both parents carry the same gene mutation. In any one generation, the probability of mating between those carrying the same genetic damage is relatively small.

"By far the most mutagenic agents known to man are chemicals, not radiation," Dr. Caldecott said. "And in this regard, food additives rather than fallout at present levels may present a greater danger."

The AEC geneticist emphasized that he in no way intends to give the impression that radiation exposure, even to the extremely small levels resulting from present fallout, might not have adverse consequences.

"However," he said, "it will be extremely difficult to pinpoint malformations in coming generations to fallout exposure at the present level."

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PUBLIC HEALTH

Strontium-90 in U.S. May Double Next Spring

► THE AMOUNT of cancer-causing strontium-90 on the ground in the United States may be doubled by next spring from the Russian bomb tests, Dr. Lester Machta of the U. S. Weather Bureau told SCIENCE SERVICE.

"In fact, by 1962 the strontium-90 fallout all over the Northern Hemisphere probably will have doubled as a result of the current series of Soviet tests and the exploded big bomb," he said. The fallout will be heaviest in the northern latitudes which include the United States, Canada, and northern Europe.

These estimates are based on the amount of fallout that resulted from the 1958 Russian atom bomb tests. About 90% came down the following spring. They are also

based on Atomic Energy Commission calculations that place the fission yield from the 1958 Soviet bombs at about 50%.

Despite Soviet claims that the present series of bombs tested are "cleaner," there is, as yet, no evidence to show that their fissionable yield is less than 50%.

Despite the large increase in strontium-90 expected from the Soviet tests, experts in Washington still believe levels will be within recommended limits. However, in order to be able to counteract excessive contamination that may result, the National Advisory Committee on Radiation Safety, working with the Public Health Service, has set up three subcommittees: one on radiation surveillance, one on biological effects, and the third on control measures that may be applied to prevent the spread of radioactive contaminants from fallout.

Some of the control measures under consideration are liming the soil, diluting heavily contaminated milk and water with that from less-contaminated areas and stockpiling powdered milk. The United Kingdom has already begun stockpiling powdered milk.

Present levels of strontium-90 in food are well within the recommended limits, and there is no reason now to keep out of the diet milk or other calcium-rich foods that tend to absorb strontium-90, Public Health Service officials emphasized. Less than three percent of the strontium-90 from the present Russian tests has reached the earth so far.

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NATURAL RESOURCES

New Plant for Converting Salt Water to Fresh

► THE SECOND of five plants demonstrating how salt or brackish water can be turned into drinkable water was dedicated by Secretary of the Interior Stewart L. Udall at Webster, S. Dak.

The plant uses an electro dialysis process to reduce the salt content of local well water from about 1,800 dissolved parts of salt per million gallons of water to about 300 parts per million. It can produce 250,000 gallons of water per day, more than enough to meet the requirements of the Webster community, which has previously used brackish water.

The electro dialysis process uses the property of certain plastic membranes to pass only electrically positive particles and of other membranes to pass only electrically negative particles. When salts are dissolved in water, they break up into equal quantities of positively charged and negatively charged particles that will move in opposite directions in an electrical field.

The first saline water conversion demonstration plant was dedicated June 21 in Freeport, Texas. A third plant is nearing completion in San Diego, Calif. These, plus others being designed for Roswell, N.M., and Wrightsville Beach, N.C., will demonstrate the engineering, operating and economic potentials of the five most promising methods for converting sea or brackish water to potable water.

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IN SCIENCE

GEOLOGY

Poles Have Shifted Thousands of Miles

► THE EARTH'S POLES have shifted thousands of miles throughout the earth's long history.

Scientists have now been able to trace the location of the North Pole about 600,000,000 years ago to the South Pacific. Since then, it has wandered throughout the Pacific Ocean, eventually reaching its present position.

The rivers of the world are the main reason causing the poles to shift. The spinning earth acting like a gyroscope shifts position when it becomes "top-heavy" in certain areas.

Rivers wearing down mountainous land transfer large masses of weight from one area to another. During a period of millions of years, the transplanted weight causes the poles to shift.

Periods of upheavals, erosion, and shifting poles have been continually recurring throughout the earth's history, Dr. George W. Bain, Amherst College geology professor, Amherst, Mass., told the Geological Society of America meeting in Cincinnati.

The process of erosion is now going on in southern Asia where the Indus, Ganges and other rivers are wearing away the Himalaya Mountains and dumping the load of sediments into the nearby seas. This shifting weight will eventually shift the North Pole deeper into Canadian territory bringing the cold Arctic weather to Montreal, Quebec and other Canadian cities.

However, it should cause no great concern in the immediate future for this will not happen for quite a few million years.

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TECHNOLOGY

Escalators in Canada For Shellfish Only

► SHELLFISH are crowding a water escalator in Canada, but they are not voluntary riders. The hydraulically operated escalators, under development by the Fisheries Research Board of Canada, recently demonstrated both efficiency and versatility as shellfish harvesters by bringing into boats such commercially important shellfish as soft-shell clams, bar clams, and oysters, 10 to 60 times as fast as a man with hand tools.

The harvesting equipment consists of a scoop that is forced along the sea bottom by the boat. In front of the scoop is a manifold with water jets to loosen the soil in which the shells are embedded. The conveyor behind the scoop rides the shells to the surface and into the boat.

The operation of the escalator harvester is limited only by water depths with depths of 10 to 12 feet about maximum.

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E FIELDS

MEDICINE

Germs Killed Quickly By New Penicillin

➤ A NEW SYNTHETIC penicillin kills "staph" germs about three times faster than local treatment such as hot soaks and drainage of the infected area.

In a study by researchers at the University of Cincinnati it was found that methicillin caused the infecting organism, *Staphylococcus aureus*, to drop off dramatically in an average of five days. It disappeared entirely in about eight days.

The drug was administered to 11 patients while 10 others received only local treatment. In patients receiving local treatment it took an average of 13 days for the organisms to decrease and about 23 days to wipe them out.

Drs. Rae E. Hartman, Alfred Lustberg and Morton Hamburger, with Judith Carleton, reported the findings at the First Inter-science Conference on Antimicrobial Agents and Chemotherapy in New York.

New powerful antibiotics reportedly cured 80% of the staph-infected patients studied by Dr. N. Joel Ehrenkranz of the University of Miami School of Medicine, Coral Gables, Fla.

Dr. Ehrenkranz based his predictions of cure on the state of the patient's health at the time of his blood-stream infection with staphylococci. The majority of "fair risk cases" were cured.

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MEDICINE

Breast Enlargement Normal in Young Boys

➤ BREAST ENLARGEMENT in healthy, adolescent boys need not worry them or their parents, a report in the Journal of the American Medical Association, 178:449, 1961, says.

Such a condition, which has been found in 38.7% of a group of healthy, normal Boy Scouts, is no indication of femininity but is a temporary, harmless and normal phenomenon. Enlarged mammary glands will disappear within one or two years and no medical treatment is recommended by Drs. Martin Nydick, Jesus Bustos and Rulon W. Rawson of New York and John H. Dale Jr., Port Chester, N. Y., who made the three-year study of nearly 2,000 boys age 10 to 16.

A large program for sending American medical know-how to the whole world at a cost of a billion dollars during the next decade was recommended by Brig. Gen. James H. Forsee, U. S. Army Medical Research and Development Command, Washington, in a special communication to the A.M.A. He recommends a new foundation with private and Governmental support and

an initial \$100 million to be used in Latin America (p. 493).

More evidence that identical twins suffer from the same ills is presented by Drs. Lewis M. Schiffer, Matthew Zucker and Eugene L. Lozner of Syracuse, N. Y. Two 79-year-old women, proved by medical tests to be identical twins, suffered from six identical ailments, among them pernicious anemia, partial facial paralysis and benign breast tumor (p. 507).

The American Medical Association's Commission on the Cost of Medical Care has begun three new research projects aimed at developments in providing medical care, rate of recovery, prices and expenditures. Inquiries will be made in San Joaquin, Calif., Washington state and in various group program situations (p. 515).

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ORNITHOLOGY

Battle Still Going on To Save Whooping Cranes

➤ THE GOVERNMENT'S fight to preserve the whooping crane from extinction continues unabated even while the threat of man's extinction from a nuclear war looms large.

Ironically, *Homo sapiens* (man), the species that may destroy itself, is the same that almost killed off the whooping whoopers.

Early in the last century, there were thousands of the big birds. They pillaged corn and consequently were considered fair game by the early settlers and tillers of the soil. Their size, four feet tall with a seven-foot wingspan, and white color made them easy targets. By 1916 there were only 14 of the great cranes left, and man became concerned.

In 1938, the Federal Government, through the U.S. Fish and Wildlife Service of the Department of Interior, made a concerted, large-scale effort to protect the small flock. The efforts have paid off, and the flock of rare birds had increased to 36 at the last count in 1960. But only 30 of the 36 have returned to their winter quarters at the Aransas Wildlife Refuge in Texas this fall.

A search is now going on for the six missing birds, and there is a good chance that the stragglers may fly in from their spring quarters in Canada before severe weather sets in. However, the four baby cranes which Canadian watchers of the whoopers reported seeing at the Canadian nesting grounds this year have joined the 30 adult cranes.

Besides their threatened extinction, the cranes have other characteristics in common with *Homo sapiens*. They mate for life and the family group lives in relative privacy and harmony. The males dominate the flock and are the respective heads of their families. They are always willing to challenge real or imagined enemies while the females stay at home looking after the young.

Each year nature lovers and tourists in Texas spend \$1,000,000 just for the privilege of peering at the cranes through a telescope mounted on a tower.

The birds get their name from their loud call which sounds like a horn and echoes a mile.

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TECHNOLOGY

Problem-Solving Machine Learns From Mistakes

➤ A LEARNING machine designed to tackle baffling problems that cannot be solved logically has been developed by Raytheon Company, Lexington, Mass.

Unlike computers, the Cybertron does not work from programmed step-by-step formulas, but attacks problems for which there are no known formulas. The machine learns by trial and error, relates new situations to past experience, and steadily improves its skill.

When the machine makes a mistake, a technician "punishes" it by pushing a "goof" button, forcing it to reconsider its decisions and modify its memory.

A small Cybertron, the K100, uses punched tapes for its learning processes and its memory storage. Used in a Department of Defense project on separating true target echoes from false radar signals, it came up with the necessary information for designing an improved filter capable of extracting more reliable information from radar equipment.

A larger model, the K200, will be able to recognize and type out typical English word sounds dictated to it. It is also being designed to squeeze spoken messages into tiny pulses that can be changed back into sound at the receiving end, multiplying by ten times the number of messages that can be sent simultaneously on one radio band.

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SPACE

Canadian Rockets Soon To Be Launched in U. S.

➤ A SERIES of Canadian rockets are scheduled to be launched at Wallops Island, Va., soon.

Scientists of the Canadian Defence Research Board will use the National Aeronautics and Space Administration's launching site because a fire largely destroyed the rocket range facilities at Fort Churchill, Manitoba, earlier this year.

Twelve Canadian Black Brants developed by the Canadian Defence Research Board for upper atmosphere research are scheduled for launching. The scientists hope, after completing these tests, to have a universal vehicle for scientific work—one that can carry a 150-pound payload 150 miles into space.

Two Black Brants are to be fired from Wallops Island in November, two more next February, six in April and two in May.

The Fort Churchill range for upper atmosphere research was built by the U. S. for use during the 1957-58 International Geophysical Year. Arrangements were subsequently made for joint Canada-United States operation.

The range will be redesigned and rebuilt at a cost of several million dollars. The U. S. will probably bear at least 90% of the cost. Range operations are expected to resume in late 1962 or early 1963.

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