

GENETICS

Control of Heredity Seen

Two theories concerning mutations, one which describes them as occurring at random and one which describes them as predictable and controllable, promise a better future for man.

► A THEORY that man can control hereditary changes may have an immense effect on humanity.

The theory claims that irradiation and chemical treatment of reproductive organs can be perfected to produce desired changes in plants and animals.

In an exclusive interview with SCIENCE SERVICE, Dr. O. G. Fahmy, the leading proponent of the theory, said the eventual applications "would be of immense value to mankind."

Dr. Fahmy, Institute of Cancer Research, Royal Cancer Hospital, London, used the word "revolutionary" to describe his work. The previous theory, which many leading geneticists still hold to be the more accurate one, embraces the concept of randomness or unpredictability of mutations.

Mutations are sudden permanent changes in the hereditary genes with corresponding changes in the progeny of the affected plant or animal.

The Fahmy group holds to the idea that

genetic changes are not only predictable, but can be controlled by a skilled person.

If this theory holds true, Dr. Fahmy predicted, then farm animals will be mutated to produce more and better meats and dairy foods. Crops will be altered to withstand adverse weather conditions. Fruit trees will be made pest-resistant and watermelons made seedless.

Other endeavors also will benefit for the good of all mankind once geneticists become sufficiently knowledgeable in the intricacies of hereditary change mechanisms, the English geneticist said.

Dr. Fahmy conceived the idea of controllable mutations while working at the Royal Cancer Hospital in 1948. He said he noted that mutations produced by some chemicals were different from those produced by radiations. This led him to believe that radiations and chemicals known as the nitrogen mustards could be made to produce preferential, although not absolutely specific, changes in hereditary material.

One of the most prominent members of the opposing "random theory" group is Dr. Hermann J. Muller, Indiana University, who won a Nobel Prize in Medicine and Physiology in 1946 for his discovery that X-rays produce mutations. Both he and Dr. Fahmy attended the International Congress on Radiation Research in Burlington, Vt.

Dr. Muller told SCIENCE SERVICE that a great deal of research has shown "striking similarities in mutations produced by radiations and chemicals." This observation tends to show that there is no preferential action on mutations, that there is little if any possibility of controlling mutations.

However, Dr. Muller said, he recently has come to see a great deal of merit in Dr. Fahmy's work. The father of radiation genetics feels that at this juncture "the weight of evidence could tilt the scales to one side or the other."

As for the practicality of the "random theory," Dr. Muller said irradiation and chemical treatment of germ cells also could result in improved varieties.

"It would be a haphazard approach," he said, "but one good mutation in a thousand would be worth the effort."

The theoretical struggle may continue in a state of flux for some time to come. At the outcome, however, humanity stands to gain either way.

Science News Letter, August 23, 1958

MEDICINE

Half of Population Will Die of Heart Disease

► HALF OF THE NOW living population of the United States, or 88,000,000 persons, may die of heart or kidney diseases related to the cardiovascular system.

This means that every other man, woman and child has a two-to-one chance of becoming a victim of heart disease.

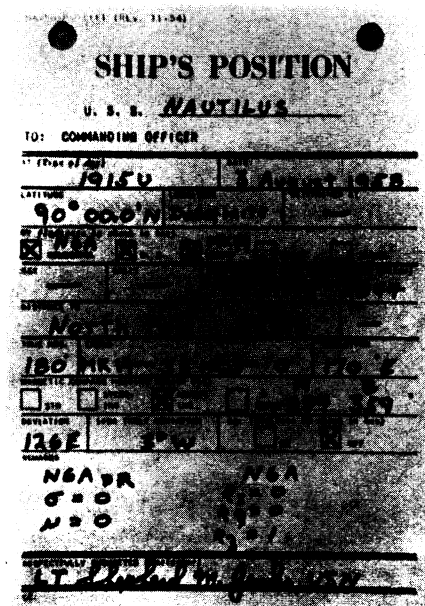
However, the best scientists and research facilities that the United States can muster are being organized to fight this killer.

The American Heart Association, in celebration of its 10th anniversary of research support, has awarded \$8,000,000 for scientific studies during the 1958-1959 fiscal year.

Scientists working in 36 states received the most recent awards, 225 grants-in-aid. A Lebanese also received a grant-in-aid. They are additional to 186 national fellowship awards announced earlier this year.

Some of the problems these researchers will attack: Does the heart that has had one attack pump less blood than it previously did or normally should; does inherited high blood pressure harm a person, or is it "normal" for that individual; further work on the replacement of heart valves by valves made of plastic; chemical process by which blood clots may be dissolved; response to some known cardiac drugs; transplantation to replace a worn-out heart; where lipids, the fatty substance that lines the arterial walls, come from, and what role they play in arteriosclerosis, the disease that took over 400,150 lives in 1955.

Science News Letter, August 23, 1958



HISTORIC PAGE — A photostatic copy of the page of the ship's log on the day the U.S.S. Nautilus reached the North Pole gives details of the conditions of longitude and latitude, with notes on instruments used and possible errors in the measurements, upon arrival. Special navigational instruments, including gyrocompasses, were used. The Roman and Greek letters refer to the ship's position and the instruments used for taking positions.

OCEANOGRAPHY

Two U.S. Atomic Subs Sail Under North Pole

See Front Cover

► TWO OF THE United States' atomic-powered submarines have succeeded in completing a polar sea trip under the Arctic ice cap.

Sailing from Pearl Harbor on July 23, the submarine Nautilus reached the North Pole at 11:15 p.m., EDT, on Aug. 3. The photograph on the cover of this week's SCIENCE NEWS LETTER shows the vessel at the surface as an officer studies the distant ice cap. The inset map shows the path taken by the U.S.S. Nautilus in its journey.

The U.S.S. Skate, which sailed from New London, Conn., on July 30 to conduct under-ice explorations in the Arctic, reached the North Pole at 9:47 p.m., EDT, Aug. 11, making the crossing from the Atlantic to the Pacific Ocean.

Reports of measurements made during the Nautilus' voyage indicate there is a "deep sea valley" ranging from 300 to 1,200 feet deep. The water at the Pole was 13,410 feet deep, or 1,927 feet deeper than had been expected. Undersea mountain ranges were also found in the Arctic Basin.

Commander W. R. Anderson said the Nautilus cruised more than 400 feet beneath the ice cap which was ten to 15 feet thick, two to three feet less than it is in the winter.

A Presidential unit citation, the first ever given in peacetime, was awarded to the crew of the Nautilus. The Legion of Merit citation was awarded Commander Anderson.

Science News Letter, August 23, 1958