GENETICS

X-Rays Can Harm Genes

If too large a dose of X-rays during routine treatment of a patient reach the reproductive glands, his remote descendants may be born defective.

➤ YOU DO NOT have to wait for an atom-bomb to receive a dose of rays that will cause your remote descendants to be crippled or otherwise defective. It can happen to you in the course of X-ray treatments for certain kinds of cancer, or even in a routine X-ray examination of your abdomen, if enough of the rays reach your reproductive glands.

This warning was given by Prof. H. J. Muller of the University of Indiana, in a lecture before the University of Chicago chapter of the Society of Sigma Xi in Chicago. Prof. Muller received the 1946 award of the Nobel Prize in medicine and physiology for demonstrating the possibility of producing hereditary bodily changes through the use of X-rays.

X-rays and other penetrating radiations used in clinics and laboratories can do the same kind of things to descendants of human beings that they do to the offspring of fruitflies, because the cell mechanisms that determine hereditary characters are essentially similar in them, and in all other higher organisms.

Most mutations are harmful, whether they occur spontaneously or through impact of X-rays or other disturbing influences, Prof. Muller pointed out. In perhaps a majority of cases they are of the type known as lethal, and simply prevent the affected individual from coming into existence at all. But if birth does take place, the unfortunate "mutant" is apt to be deformed, or blind, or abnormal in some other way.

These misfortunes of X-rayed fathers (and mothers) are more likely to be visited on descendants in third and fourth and subsequent generations than on their immediate offspring, Prof. Muller pointed out. Their coming to light depends on the meeting in reproduction of two deficient genes, for if one normal gene is present it will possess the controlling influence, and the deficient gene will simply be carried forward into another generation, to lie in wait for its "opposite number."

X-rays and other rays produce hereditary changes in two ways, Prof. Muller told his audience. The first is the result of an impact on a single gene, changing it from normal to deficient. The second method of change is more easily demonstrated, for it consists in the breaking apart of a whole chromosome by a ray. The broken ends tend to re-unite, but if the patch takes place in the wrong way results in succeeding generations are apt to be unfortunate.

However, X-ray doses are capable of harming the individual who receives them, even if the usual warning signs such as reddened skin and loss of hair are absent, Prof. Muller warned in conclusion. Recent statistical studies, he declared, have demonstrated that the life-span of persons given courses of X-ray treatments is significantly lowered. For this reason, he suggested strongly the use of alternative treatments, where such exist.

Science News Letter, November 13, 1948

MEDICINE

Vitamin Lack May Be Cause Of Heart Troubles, Cancer

➤ LACK of some still undiscovered vitamin or other chemical may be the cause of artery hardening, high blood pressure, heart disease and cancer. This possibility was suggested by Dr. Tinsley R. Harrison of Southwestern Medical College, Dallas, at the meeting of the Association of Life Insurance Medical Directors of America in New York.

In the world search for not only longer but more useful and vigorous life, great strides have been made in conquering two degenerative diseases, diabetes and pernicious anemia, Dr. Harrison pointed out.

Each of these diseases is due to lack of a chemical needed by the body, insulin in the case of diabetes and a substance in liver in the case of pernicious anemia. Other degenerative diseases might, he suggested, also be due to "deficiencies of substances or processes as yet unknown."

Science News Letter, November 13, 1948

ELECTRONICS

Electronic Pencil Enables Composers To Hear Score

➤ COMPOSERS may now play the music they have written on a simple electrical machine by writing out the score with an electronic pencil.

The new composer's music box was described in Cleveland to the Acoustical Society of America by Prof. Robert B. Watson of the University of Texas physics department and defense research laboratory.

"Some composers are able to hear the music mentally at the time of composition," Prof. Watson explained, "but others desire to hear certain musical passages while composing. A composer may now use a compact electro-acoustic device to produce various tones with comparative ease and little distraction from writing his musical score."

The music box is operated similarly to writing with paper and pencil. The tone is started by placing the electronic pencil on

COMPOSER'S MUSIC BOX—Musical scores can now be written with an electronic pencil which permits the composer to hear his music while he is composing it. Pitch and volume are varied by moving the pencil.