

NUCLEAR PHYSICS-BIOLOGY

Radiation Produces Freaks

Mice with stomachs which burst from swallowed air are produced by irradiation of mothers. Abnormalities vary with the age of the embryo at irradiation.

➤ BABY mice whose stomachs blow up like balloons and burst from swallowed air, because their deformed mouths do not allow them to nurse normally, are among the abnormal types produced by irradiation of their mothers.

Such effects of radiation, whether from radioactive materials produced in the atomic pile or from X-rays, are being studied as part of the research program of the Biology Division of the Oak Ridge National Laboratory.

Comparison with the effect on human babies whose mothers received X-ray treatments during pregnancy is not possible as yet. Not enough is known about abnormalities which could be traced to such a source nor about comparative doses of radiation in humans and in mice.

Studies at the Oak Ridge National Laboratory suggest, however, that treatment with X-rays at any stage of pregnancy is attended by grave risks to the developing child. The Oak Ridge geneticists find that there is no threshold below which X-rays do not produce some effect. The only question is whether the effect is so slight as not to handicap the offspring, or so severe as to produce a monster incapable of developing into a normal human being.

Damage such as the piece broken off the gene by a passing neutron is being studied. Other damage under study is the cumulative effect on future generations from mating of apparently normal individuals carrying injury inherited from irradiated parents and grandparents.

Abnormalities of development occur when developing embryos are irradiated, and the type of abnormality is found in these studies to be determined by the prenatal age of the baby. An X-ray dose on the ninth day after conception may spoil the formation of the mouth so that only air is swallowed when the newborn mouse tries to nurse. The same dose on a different day may result in an entirely different kind of malformation, such as fusion of the elbow joint to make the forelegs stiff and useless. Milder types of abnormalities result in mice with forked tails, mice without hair, and even mice with defective skins.

Effects of irradiation of parent mice are followed through many generations of offspring in the studies, which are expected to furnish information never before gathered on the results of rays, whether from accidental exposure to radioactive sources or from medical treatment. Abnormalities which have been found so far are of the

same type that occur among mice not known to have been irradiated. They seem to occur more frequently among the descendants of animals exposed to such rays.

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AGRICULTURE

Water for Crop Irrigation From Man-Made Snow Drifts

➤ ELEVEN-FOOT drift fences which mound up large catches of snow at high altitudes in the Western mountains may increase valley stream flow sufficiently to add nearly half a month to the irrigation season.

This extension, amounting to some 12 days, would come during the parched days of July when the extra irrigation would be most welcome.

The possibilities of high altitude "snow dams" are being explored by Foresters H. W. Lull and H. K. Orr of the U. S. Department of Agriculture, who are experiment-

ing with drift fences on the catch basin of Ephraim Creek, high in the Wasatch Mountains of Utah.

They have been setting up drift fences of the familiar slatted kind used along highways. They find that a seven-foot fence is ineffective, but that 11-foot fences caught deep drifts which remain unmelted for as long as 12 days after undrifted snow has disappeared.

The drift fence experiment is designed to prolong the period of useful moisture in areas where it is uneconomical to build a reservoir for the purpose. Ordinarily snow melt provides irrigation water during the spring, with an over-abundant flow during May and June.

If the snow can be successfully held in the mountains for an additional period, the farmers of the arid valleys would benefit materially.

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MATHEMATICS-ENGINEERING

Baby "Brain" Gives Quick Answers for Big "Brother"

➤ A BABY "brain" that quickly solves problems so that its big "brother" can do further work on them was announced in Cambridge, Mass.

This machine is an electronic differential analyzer. Although it solves problems quickly, it is not as accurate as the larger



THE ANSWER—The answer to a complicated differential equation solved on the new bantam electronic differential analyzer in the Research Laboratory of Electronics at Massachusetts Institute of Technology is read by Robert H. Cannon, Jr., instructor in mechanical engineering (right). Ragnvald Maartmann-Moe (left) operates the machine. The round screen in front of Mr. Cannon shows how a hypothetical speedboat would actually move through sea waves of the type portrayed on the screen at the right of the picture.