

## GENETICS

# Atomic Heredity Damage

**Nobelist H. J. Muller warns denial of atomic damage to future populations weakens morale. Even Pacific tests plant thousands of harmful mutations in population.**

► DENIALS OF damaging hereditary effects by atomic radiation "weaken public morale and open the door for defeatist propaganda," Indiana University's Prof. H. J. Muller, Nobel Prize winning geneticist, told the National Academy of Sciences in Washington upon the occasion of receiving one of the two recently established Kimber genetics awards.

"So many people are already aware of the damaging action of radiation on heredity," he said, "that these attempts in high places to disclaim the danger cause the public to lose confidence. On the recoil, the public then becomes more likely to swallow another widely circulated counterclaim that the hereditary constitution of all of humanity is being seriously undermined by our tests of hydrogen bombs and that the tests should be stopped for this reason. In my view this claim is equally false."

The Nobel Prize in medicine for 1946 was awarded Prof. Muller for proving that X-rays produce mutations, or changes in the genes, the heredity controlling factors in reproductive cells.

Prof. Muller disputed recent claims that radiation, even in such quantity as that to which the people of Hiroshima were exposed by the atomic bomb, would cause no damage to later generations.

"The group of responsible scientists," he said, "who in 1953 signed the official report on investigations of the Hiroshima-Nagasaki after-effects, stated that it had 'always been doubtful whether significant findings' could be obtained by the methods there used. They pointed out that the inconclusive results, while not definitely positive, were at the same time 'entirely consistent with what is known of the radiation genetics of a wide variety of other material.'

"In other words, there could well have been as many harmful mutations produced in these human populations, but lying undetected, as experiments with other animals have shown to be produced in them by such exposure.

"The numerous disabilities and deaths among Hiroshima survivors will be spread out very thin over a large number of generations. The effect in any one individual usually will be slight, although enough finally to extinguish his line of descent. Therefore, the overall cost, although great, will be too scattered and insidious to affect the population as a whole noticeably."

Prof. Muller attacked recent assertions that heavy exposures of human beings to radiation may even result in their descendants being benefited.

"This sort of thing," he said, "has been found to occur in fruit flies irradiated

heavily for generations because, in fruit flies, it is the usual thing for more than 100 young to die for every one that survives. Thus the many flies inheriting a weakened heredity tend to die out fairly quickly.

"They could be replaced by the rapid multiplication of the extremely rare beneficial mutations that were produced. But in a human population such a situation would be ruinous."

Referring to the H-bomb tests in the Pacific, Prof. Muller said: "The Atomic Energy Commission has recently stated that the radiation received by the average American from these tests to date is only about as much as is received from a chest X-ray, or one-tenth of an r-unit. Since there were 160 million people receiving this H-bomb radiation, as compared to the 160,000 persons who survived Hiroshima after getting a thousand times this dose, there must have been about as many mutations in both areas."

Figures showing that this amount of radiation could lead to tens of thousands of harmful mutations inherited by the next generation were cited.



**ATOMIC COMPACT** — This case, no larger than a rouge compact, was designed to measure radiation at the Atomic Energy Commission's test site in Nevada. Glass in the lower half of the unit is radiation sensitive.

"However, relatively to the size of the two populations," he said, "the effect is only a thousandth as great in the U.S.A. as a whole as was concentrated in Hiroshima. This certainly does not undermine the heredity of our population as a whole significantly.

"Each individual harmful mutation is, however, an evil, and we have no right to dismiss it lightly. Therefore we must base our case for the continuance of the tests squarely on the fact that they are at the present stage necessary to prevent our being put at a military disadvantage. Only from a position of all around strength, I think, can we finally reach a situation where general disarmament is feasible.

"The same kind of reasoning justifies the use of carefully controlled X-rays and radioactivity in medicine. That is, the genetic damage should be admitted and weighed against the benefits. But a recent survey shows that Americans are receiving much more radiation in these ways than as a result of all atomic and hydrogen test explosions.

"Most of the genetic damage from medical uses of radiation could be avoided if only physicians would admit its existence and take certain simple precautions to reduce it, such as shielding the reproductive organs, and limiting and keeping track of the total amount of exposure of each patient over many years.

"It is largely this reckless attitude on the part of physicians which has influenced extremists to claim that nuclear explosions are harmless or even beneficial."

Science News Letter, May 7, 1955

## PUBLIC SAFETY

## Asphalt Mat to Reduce Atomic Test Fall-Out

► A NEW safety feature for protection against radioactive fall-out, now a much dreaded result of nuclear weapons, is being tested in Operation Cue atomic test.

It is the new asphalt base to the tower where the nuclear device is set off. It points up the dilemma authorities face.

The asphalt base is being tested in the hope that it holds together the very light soil particles like those of Frenchman Flat's dry lake bed so that less of them will float off in the mushroom cloud.

It is hoped that the asphalt base will result in lumps rather than particles of soil and that these lumps will either stay on the ground or fall out very quickly to the test site or nearby bombing range.

This will give greater protection to populations in the fall-out area, an expanse that may grow larger and larger as more powerful nuclear weapons are tested.

Radioactive fall-out has led to a new type of shelter, one with exit door. This is for use in basements. Heretofore doors have not been recommended because of the increased danger in case of blast. One shelter with and one without doors are being tested side by side in the current detonation.

Science News Letter, May 7, 1955