PHYSICS

From Now On: Radiation

H-bomb radiation might poison atmosphere and effect harmful changes in future generations. The danger of atomic war must be minimized.

By WATSON DAVIS

Eighth in a series of glances forward in science.

➤ RADIATION may bring the downfall of the human race. If the deadly blast of neutrons, gamma radiation, and other debris from explosions of A (fission) or H (light-element) atomic bombs do not wipe out large portions of the world's population, they may so insidiously poison the atmosphere that everyone may be endangered.

This is not a cheerful prospect, but it is one that must be considered.

When X-rays were first discovered in the last decade of the last century, some of the physicians who used them to view broken bones did not realize the danger from them. They exposed themselves to the X-radiation so much that before the danger from X-ray burns was realized they had suffered damage. Sometimes the damage did not appear until years later when some of these good doctors developed skin cancers which resulted in loss of fingers, hands or sometimes death.

Today there is great care taken in use of X-rays, and even concern about the long-time effects of such devices as the simple X-ray machines that are sometimes used in fitting children's shoes.

Aside from the effect upon the person who is irradiated, there is the possible change in the germ plasm that may be handed down to future generations. Dr. H. J. Mueller won a Nobel prize for his discovery of the mutations (changes in the hereditary qualities of the germ cells) caused by X-rays in fruit flies. A prime concern over the effect of the atom bomb in Japan has been what changes in human characteristics may show up in the next few generations of the descendants of the survivors of those blasts.

There is one source of radiation that we can do little about. Cosmic radiation from outer space rains upon all of us, with a particle shooting through our bodies every few seconds. This has been suggested as a possible cause of changes in human heredity, over long periods of time. They may even cause cancer or have something to do with it, although this is highly speculative.

There is possibility of control of radiation that is being introduced into our daily civilized life from a variety of sources. Great care to reduce radiation danger is taken at atomic energy research laboratories. The radioactive isotopes for research and medical use are dealt out with a realization of their danger. With a world at peace, the radiation danger can probably be kept under control, although there are some scientists who are very apprehensive about a rising world contamination with remote but dangerous effects.

All the radiations, whether from X-ray tubes, radium, other radioactive elements, or atomic bombs (fission or H-type) have the same possibility of changing the future course of heredity in living things, animal or vegetable.

If atomic war comes, the dangers will be multiplied greatly. The atmosphere might be filled with radioactive dust which everyone would have to breathe. Radioactive clouds might be used as a weapon to add to the debris of the bombs themselves.

To combat the radiation menace, we should:

A. Minimize the danger of atomic war in all possible ways (which is easier said than done).

B. Recognize the dangers to ourselves and future generations from exposure to radiation, although in peacetime the medical, health and industrial authorities can be relied upon to give us this protection generally.

C. Continue research upon the radiation problem, both through experimentation with animals and plants whose generations are swifter than ours, and through study of human population exposures.

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ENGINEERING

Petroleum in 2000 A.D.

➤ PETROLEUM in the year 2000 A.D. will still be a major fuel and chemical raw material, despite gloomy predictions of early exhaustion, Dr. Gustav Egloff of the Universal Oil Products Co., Chicago, told the American Institute of Chemists in New York.

Refining of 16,000,000 barrels of petroleum daily 50 years hence is foreseen, compared with 6,000,000 barrels daily now. Natural gas production in 2000 A.D. will be 21,000 billion cubic feet per year, compared with the present 6,000 billion cubic feet.

Only one percent of this immense predicted production will be needed for making chemicals from petroleum, Dr. Egloff explained. Oil and natural gas are even replacing coal as the raw material for organic chemicals so important to modern life. Fifty years ago practically no chemicals were made from petroleum. The chief petroleum product was kerosene in 1900. The petrochemical industry began in the early 1920's, with about 12,000,000,000 pounds produced from petroleum and natural gas this year. Dr. Egloff's estimate for 2000 A.D. is 48,000,000,000 pounds.

Fifty years from now practically all of our ethyl alcohol will be synthetic, Dr. Egloff believes, because grains and other foods will be needed to feed the increased population. Synthetic glycerin will dominate the market in the year 2000.

Chemical insecticides, weed-killers and other new products, based on oil, will be developed at a tremendously increasing rate for improving agricultural operations, Dr. Egloff predicted.

Synthetic rubbers, made from oil and gas, will total 2,000,000 tons in 50 years, quintupling the present output.

Most of our clothing in the next half-century will be made basically from petroleum, with synthetic fibers steadily replacing cotton and wool.

Soapless soaps, now a billion pounds production annually, will reach five times that in the next five decades.

More of the aromatics, such as benzene, toluene and xylenes, now obtained from coal carbonization, will come from petroleum.

Dr. Egloff predicted that the next 50 years would see the commercialization of 13,500 new chemicals.

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MEDICINE

"Factory Thumb" Replaces "Washerwoman's Sprain"

➤ "WASHERWOMAN'S sprain," a painful and disabling condition of the wrist, has become "factory thumb." Washing machines do women's traditional work and women do factory work such as putting tight fitting rubber rings over pipes.

One result is that the tendons of certain thumb muscles are sprained from pressure in certain jobs. The sheath of the tendon becomes inflamed and the pain extends into the wrist and up the arm. Then the hand grows weak and the patient continually drops even small objects.

Surgical treatment brings 100% cures, and no other treatment helps much, Dr. Leo Frederick Miller of Chicago has found, and reported to the American Association of Industrial Physicians and Surgeons.

The operation is simple, done under local anesthetic, the thumb may be moved in two days and can be used fully in two weeks.

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