# Low-level radiation - It's Everywhere

The concept of low-level radiation is hard to grasp - first, because you can't sense it, and second, because it's everywhere. Radiation is a naturally occurring phenomenon to which everyone is exposed. The problem with radiation is that people began spreading additional radiation into the earth, water, and air when they began nuclear weapons development - and that addition has increased even more through the use of radiation in x-rays and energy production.

People absorb radiation through all parts of their body and in all sections of the nuclear fuel Cycle. Uranium is not an active, dangerous element until it is exposed to air and begins to break down into a series of radioactive substances. We are exposed to radiation from uranium and other mine exploration - it gets into our water, blows into the air, and is spread on the earth when samples are brought from underground. Blasting and digging done for uranium mining raise clouds of radioactive dust that can be inhaled by miners or blown out of mine ventilators, spreading radon gas over the countryside. The radon breaks down quickly into other radioactive particles known as "radon daughters," which can also contaminate the air, water and earth.

After the uranium is mined, it is transported to a mill to be processed. Movement of radioactive materials particularly affects dock workers and truck drivers, but the general population is exposed whenever a "nuclear traffic accident" occurs and they occur regularly. The mill itself causes contamination of the local area in several ways. First, the building itself becomes radioactive. Second, workers are exposed to radiation. Third, mills emit radioactive gases; and, most important, the wastes from mills, tailings, are fine-grain particles that are blown and leached into the environment.

When the uranium has been milled into "yellowcake," it is again transported by air, rail, or truck to a nuclear reactor or weapons facility. Again, the buildings themselves become "hot", and workers are contaminated. Water used to cool reactors is also "hot", and the plants regularly emit gaseous effluents that spread over the nearby area.

When the uranium is used up, the wastes are moved to a disposal site. One of the biggest problems facing the nuclear industry and the public is the lack of a way to contain these wastes until they are no longer harmful. Leaks from storage facilities also spread radiation into the air, water, and earth.

So, there is radioactive leakage into the environment at every stage of the nuclear fuel cycle-and many ways. Radioactive substances from the air can be inhaled or deposited on surfaces we come in contact with - homes, water, roads, etc. We can also come in direct contact with low- or high-level radiation by swimming in or drinking contaminated water.

But people are not the only living things taking in radioactivity. Because radiation is long-lived, it is also transferred to people when it builds up in foods we eat. Plants take on radiation-plants that we eat ourselves and plants eaten by the animals we later eat. Fish, cows, clams, game, sheep, and other animals give people the radiation they have ingested. Milk produced by cows that have been exposed to radiation shows higher levels of strontium-90 as samples are taken nearer to the source of the pollution. (2 percent radioactive milk, anyone?)

The different kinds of radioactive substances that occur as uranium breaks down concentrate in different parts of the body. The amount of time it takes these different substances to break down to half of their original radioactivity their (their half-lives) vary from 12 hours for Potassium-42 to 24,000 years for Plutonium - 239 So, Plutonium we allow into the environment now will be dangerous to our descendants' distant descendants - and their plant and animal surroundings.

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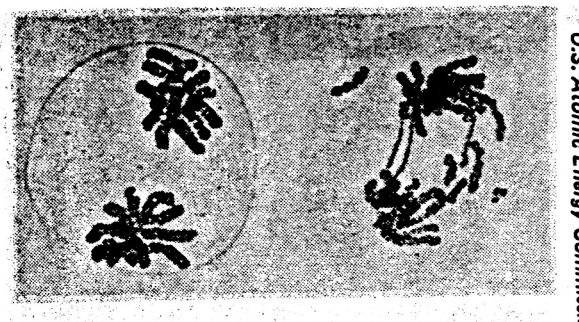
- Lilias Jones



U.S. Atomic Energy Commission

Effects of ionizing radiation on chromosomes. (Chromosomes comprise thousands of genes.) Left, a normal plant cell showing chromosomes divided into two groups; right, the same type of cell after X-ray exposure, showing broken fragments and bridges between groups, typical abnormalities induced by radiation.

REPRINTED FROM: Black Hills/Paha Sapa Report, printed monthly by Black Hills Alliance, P. O. Box 2508, Rapid City, S.D. 57709