The finding of excessive leukemias (cancers of the blood-forming cells) among atomic workers at the Oak Ridge National Laboratory in Tennessee (see RHWN #244) raises the specter of health damage from radiation exposures thought to be entirely safe.

This is not the first time the specter has been raised.

In November, 1983, a British television station ran a documentary called "Windscale: The Nuclear Laundry" about the Windscale nuclear fuel reprocessing plant on the coast of Cumbria. The TV program suggested an excess of leukemia afflicting children in villages near the plant.[1]

The TV program led to an official British government investigation (the "Black Report" of 1984), which led to more studies.

Nearly seven years later a careful analysis of the situation concluded that, yes, there is definitely an increased occurrence of leukemias near the Windscale plant (which has, in the meantime, been renamed the Sellafield plant). The risk of leukemia and/or lymphoma (cancer of the lymph nodes or spleen) among children near Sellafield is 10 times normal.[2]

The study's authors believe that children near Sellafield are getting cancer as a result of their fathers' exposure to radiation at work before the children are conceived. They believe children are inheriting a genetic defect caused by radiation exposure of the fathers' sperm. An alternative explanation is that the fathers become contaminated at work and somehow carry radioactivity home (perhaps on their clothing), thus irradiating their unborn children during pregnancy or very early in life. In any case, the exposures to the children are small but the effects are grave, so this bodes ill for nuclear technology and for its promoters.

In the meantime, while the Sellafield study of childhood leukemias was going on, the British Office of Population Censuses and Surveys conducted its own study of cancer deaths within districts near 14 nuclear facilities, including power generating stations.[3]

They found increased myeloid (bone marrow) leukemias and brain tumors among young people (age 24 and under) living, on average, five miles or less from nuclear installations, including nuclear power plants.

A 1989 study of three U.S. government nuclear weapons plants revealed increased leukemias.[4]

A 1988 study of workers at British nuclear weapons plants revealed cancer rates twice the national average for cancers of the prostate gland and kidneys.[5]


So the revelation in 1991 of increased leukemias among workers at Oak Ridge National Laboratory (see RHWN #244), viewed in historical perspective, does not seem very surprising.[7]

In fact, after reviewing the literature cited above, one begins to be surprised by studies that show no cancer increases among people exposed to low levels of radiation for long periods of time. For example, a 1991 study by Seymour Jablon and others[8] in the Journal of the American Medical Association (JAMA) finds no increased cancers in people living "near nuclear facilities." The authors say they initiated their study of U.S. nuclear power plants specifically because of British reports finding leukemia and lymphomas among young people living near Sellafield.

JAMA provides an editorial to help interpret the Jablon study.[9]

The editorial declares that, "This study, in conjunction with the extrapolated results from high-dose studies [of Japanese survivors of atomic bombs], provides substantive evidence that the normal operation of nuclear facilities in the United States does not lead to any undue risk of cancer in those residents living near such facilities." Living near such facilities? What does that mean exactly?

In the case of the British studies, living "near" means living, on average, within 5 miles; in one study it means living within 3 miles. But in the Jablon study, living "near" seems to mean living, on average, 14 miles from a plant.[10] Thus the Jablon study has included many people whom you would never expect to be "exposed" by living "near" a nuclear facility because, in fact, they live so far away. Thus any real cancer effect that might exist among people living near a U.S. nuclear facility has been diluted by the inclusion of thousands of people who are not affected. Jablon chose to study entire counties that contain nuclear power plants, not the towns or--better yet--zip codes really near nuclear facilities. In this way, Jablon is able to report "no problem" when, in fact, his study seems incapable of revealing a problem of the kind the British have discovered, even if one exists. In its investigative power, Jablon's study is certainly not comparable to the British studies that, he says, prompted his own work.

Thus do we learn that this science business is subject to manipulation and to differing interpretations, even when everyone is playing by the rules.

Do six individual studies (cited in footnotes 1 through 7) linking nuclear facilities to cancer prove in a scientific sense that living near a nuclear plant, or working with radioactive materials, increases your risk of cancer? Perhaps not, in a scientific sense. On the other hand, do those studies show, beyond a reasonable doubt, that you're better off avoiding radioactive materials whenever possible? Seems to us they do.

--Peter Montague


[10] In fact, unlike his British counterparts whose work prompted his own, Jablon gives us no details about the location of the plants he studied in relation to the humans he studied. Jablon studied the populations of U.S. counties containing nuclear power plants. The average U.S. county covers an area of 1190 square miles. This is equivalent to a square 34.5 miles on a side, or a circle with a radius of 19.5 miles. If we assume a nuclear facility lies near the center of a county, then the half of the county's area closest to the facility will lie within a circle with a radius of 13.8 miles, and half will lie outside that circle. Thus if we assume, on average, a uniform distribution of people in the county, half will live 14 miles or less from a plant, and half will live further away.

Descriptor terms: radiation; leukemia; cancer; oak ridge, tn; Windscale; black report; Sellafield; childhood cancer; genetic disorders; bone marrow; brain cancer; Plymouth, ma; Hanford, wa; wa; tn; seymour jablon; health effects; nuclear power;