Taming the Nuclear Machine: An Interview with Daniel Hirsch

Daniel Hirsch retired in 2017 as Director of the Program on Environmental and Nuclear Policy at the University of California-Santa Cruz. He taught for many years at UCSC and before that at UCLA. He is President of the Committee to Bridge the Gap, a nuclear policy NGO, which he founded nearly half a century ago.
www.committeetobridgethegap.org

This interview was conducted by David Bezanson, MD in the CBG headquarters near Santa Cruz, CA on January 31, 2019.

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DB: Why did you found Committee to Bridge the Gap?

DH: Inspired by Gandhi's teachings on nonviolence, having studied with the nonviolence scholar Gene Sharp at Harvard University, and impelled by my deep concern over wars in Cambodia and Viet Nam; I set out on a life-long path of activism. As an undergraduate at Harvard University, when Nixon invaded Cambodia and students were killed at Kent and Jackson States, I helped get the university to close in protest and send students out to their home communities to work against the war. I went to Los Angeles, where I grew up, and helped establish Campus Committee to Bridge the Gap, now called CBG. Small teams of students trained in non-antagonistic communication techniques and the history of the Indochina War met in small groups with older people who supported the war in an effort to change attitudes about it.

Since graduating from Harvard in 1972 I worked more than full-time within CBG for 20 years or so without any pay.

Commencing in 1975 I taught as a lecturer at University of California - LA on human rights, nonviolence, and energy policy. I also helped to launch a group for health professionals in L.A.: Helen Caldicott, M.D. contributed her energy to this. I have collaborated with the L.A. chapter of Physicians for Social Responsibility since its inception in 1980 and had a role in its creation.

Perceiving that citizens saw issues of nuclear weapons and power as distant from their lives, CBG examined nuclear risks in the L.A. area to educate about their relevance to the local community. We identified a hitherto-unknown local dump for radioactive waste materials and Navy launches of plutonium-powered satellites that failed to achieve orbit (landing nearby in the ocean). We helped halt the practice of radioactive waste being dumped into the ocean internationally. We helped expose plans for orbiting nuclear sources as part of Reagan's Star Wars proposals. We disclosed a partial nuclear meltdown in the L.A. area that had been kept secret for 2 decades. We subsequently facilitated the creation of epidemiological studies finding a positive correlation between radiation exposure of workers at the site and mortality from cancer. We contributed to the closure of the Santa Susana nuclear weapons laboratory and test site, which is still contaminated with an array of toxins and radionuclides.

Next to the UCLA building where I taught, there was a nuclear reactor. This contained enough highly enriched uranium to manufacture 5 bombs. The lab was emitting radioactive noble gases, e.g., Argon-41, far in excess of NRC limits. We organized a press conference to disclose this violation and inadequate security issues. With the help of international nuclear experts we challenged the relicensing of the UCLA reactor. At one point, the NRC administrative law judge hearing the case directed the UCLA attorney as well as NRC's attorney to demonstrate why they shouldn't be found to have committed misconduct in the case. UCLA decided to forgo applying for license renewal and the lab was consequently closed.

DB: Has CBG worked on improving safety/regulatory reform via politicians? What has been the outcome?

DH: Yes, in all 3 branches of the government. Examples of issues we have worked on are banning the dumping of radioactive waste outside of licensed radwaste sites and contribution to the shutdown or phase out of 2 nuclear plants (San Onofre and Diablo Canyon).

DB: The CA Air Resources Board reports that levels of gamma and beta radiation are safe in CA cities. Would reporting levels of other types of airborne ionizing radiation be useful to guard public safety?

DH: The CARB website has a link to RADnet, which is currently inoperative. Access current data via

www.epa.gov/radnet. This is designed to display the levels in major cities throughout the USA. However, I have found that half of the monitors are malfunctioning and none of them measure beta levels. Displaying the levels of each kind of ionizing radiation would help the scientific community to conduct research and protect public health. Anthropogenic ionizing radiation (e.g. from nuclear power and weapons) adds to the naturally-occurring background radiation and increases risk of illnesses including cancer.

DB: Ionizing radiation is commonly found in topsoil, botanicals (including crops), livestock, wild game and fish, and water resources (including public water supplies). Is the annual exposure from the total of these sources at unsafe levels in California? Are levels increasing in areas that are distant from nuclear facilities?

DH: The National Academy of Sciences and numerous other scientific and regulatory bodies presume there is no safe level of radiation. The current NRC radiation exposure limits are estimated by EPA to be far above acceptable risk levels set for all other carcinogens.

DB: Has CBG been harassed or threatened by nuclear power companies or regulatory agencies?

DH: Yes, many times.

DB: The only operating reactor in California, Diablo Canyon (a more apt name could not be created by Lucifer!), is scheduled to shut down in 2025. Located on the Pacific Coast, the site is at risk from rising ocean levels and seismic activity from proximal fault lines. When mothballed, where do you recommend that fuel rods be stored? In what kind of casks?

DH: When Pacific Gas &Electric announced plans to build the twin reactors, they declared that there were no active seismic faults in the vicinity. A large nearby fault was discovered when the reactors were 80% complete. Seismic retrofitting was then completed. In recent years, 3 additional proximal faults were discovered. PG&E decided not to renew the license because reactors are not economically viable. The state of CA has directed public utility companies to increase power generation from renewables like wind and solar. The Diablo phaseout agreement requires that its power be replaced with renewables. The cost of these, per gigawatt, is falling whereas the cost of nuclear electricity is rising.

Disposal of irradiated fuel is a major problem. Until a permanent national repository is established, Diablo's waste is best stored nearby - further inland and in a building that would contain potential radioactive releases were dry casks to fail. My recommendation is the same for the San Onofre reactor. This storage plan avoids the risks and costs of transporting casks to a distant interim site, from which it would have to be moved again at a later date to a permanent repository. Furthermore, no suitable interim or "permanent" geologic site has been located that is safe for long-term storage.

DB: Is CBG interested in adding more volunteers? May some of these tasks be performed remotely?

DH: Yes and yes. Only some are university students. Others are welcome.

DB: Has CBG collaborated with other nuclear safety organizations, governmental or NGO?

DH: Yes, Physicians for Social Responsibility, Natural Resources Defense Council, and many others.

DB: In addition to being well-informed, what can citizens do to curtail environmental levels of anthropogenic ionizing radiation?

DH: Political activism is required to facilitate the transition from nuclear power to renewables; and to expedite global nuclear disarmament.

DB: Cold wars and nuclear arms races are intensifying. What can citizens do to prevent nuclear war?

DH: Elect responsible politicians, especially at the federal level. These politicians would have the following characteristics: a) use of current scientific consensus to guide policy and regulation; b) making public safety, health, and the environment high priorities; c) sophisticated diplomacy and foreign relations skills to proactively and nonviolently resolve conflict.

DB: Do you advise stocking up on potassium iodide?

DH: No. There are risks of taking KI, which only protects against ionizing radiation from radioiodine. Exposure to many other radionuclides is of concern.

DB: The majority of the world's 450+ reactors are over 30 years old. Are the most current "next gen" designs safer and do they have a lower environmental impact over their life cycle?

DH: No. These are merely copies of breeder reactors proposed in the 1950s and 1960s. They synthesize more plutonium than they consume. Instead of using water as a coolant, they use liquid sodium, which is highly explosive and combustible in the presence of water or air. Plutonium (and HEU) are the fissile materials most oft used to manufacture nuclear explosives. The most common isotope for nuclear weapons, Pu-239, has a half life exceeding 24,000 years.

DB: Is science nearing discovery of a way to diminish the half life of fissile material?

DH: No - not even close.

DB: How do reactor manufacturers and nuclear utility companies exert influence on nuclear regulatory agencies?

DH: Straight capture. Organizations like the Nuclear Energy Institute, International Atomic Energy Agency, and Nuclear Regulatory Commission ignore or suppress publication of research pointing to the risks of nuclear industries. The nuclear industry and allied groups facilitate publication of claims that falsely assert that ionizing radiation poses no risks. By conducting a thinly-veiled greenwash campaign and perpetuating ignorance, they alienate themselves from the public - leading to mistrust and skepticism about their policies.

DB:What is the current rationale for continuing subsidies, loan guarantees, tax credits, and liability waivers to the nuclear power industry? (The Energy Policy Act, last amended in 2005, provides significantly more financial incentives for nuclear power, and for fossil fuel energy, than for energy efficiency or renewables.)

DH: In the 1950s these were used to jump-start a fledgling industry. At that time, there was little research quantifying the risks of ionizing radiation to public safety and health. Current research reveals that a) nuclear weapons and power pose unacceptable risks to all species, b) nuclear electricity has a higher cost/GW and risk/GW than renewables.

DB: As recommended by the International Atomic Energy Agency, has research examined the environmental impact, including greenhouse gas emissions, of the complete lifecycle of reactors? There are studies of the front end (mining, transport, manufacturing, construction) and operating phase, but I have not seen an analysis of

the EI of the back end (decommissioning, mothballing, reactor security, manufacture of casks, multi-century entombment of spent fissile material, security of entombment, reactor demolition, removing ionizing radiation from mining sites and cooling water, medical treatment of exposed citizens, etc.).

DH: I have not encountered such. It is needed to guide public policy and regulation.

DB: Does any form of electricity generation have a risk/GW and environmental impact/GW that matches or exceeds that of nuclear power?

DH: Risk/benefit research is needed.

DB: Have scientists quantified a multi-century estimate of the mutagenic effects of ionizing radiation on exposed species of plants and animals - including humans? Do mutations increase the probability of unknown mutations in successive generations? (The majority of mutations impede adaptation.)

DH: I defer to scientists in biology, genetics, and allied fields.

DB: The CBG website has an article, endorsed by many organizations and dated 2015, indicating that the Linear No Threshold paradigm is still valid. I.e., there is no dose of ionizing radiation that is safe. In recent years, many articles have appeared in PubMed questioning the LNT paradigm and advancing the theory of radiation hormesis, i.e., that small doses of ionizing radiation are beneficial. I have not found any that present empirical evidence of hormesis in human subjects. Have you?

DH: There is at present no convincing evidence supporting hormesis, and much that contradicts it.

DB: Has a moratorium on construction of new reactors been considered by politicians? What do you think of the policy?

DH: Yes, in several nations. Germany plans to phase out reactors. On a defacto basis, this is occurring in USA where there are few approved plans to construct or extend reactor licenses. Renewables are one of the fastest growing industries. There are many uses for nuclear technologies (other than weapons and power) that appear to have favorable risk/benefit and cost/benefit ratios. Unless safety, health, long-term storage, environmental impact, enablement of nuclear weapons proliferation, and prohibitive cost/GW problems of nuclear power are solved, reactors will not be a viable option to feed our grid. Until then, a moratorium is prudent.

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