

RADIATION PERSPECTIVE IN THE UNITED STATES OF AMERICA

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I would like this morning to discuss briefly some of the issues that nuclear power plants and x radiation in particular pose to the consumer movement in the United States. After all, consumers are to be either the prime beneficiaries or the prime victims of this source of risk and, until recently, they have not been even minor beneficiaries of adequate information or adequate participation in the decisions that have been made.

Our country rests its premise about our economic and governmental structure on citizen and consumer participation - not just at elections, but in between elections - not just on Congress, but on regulatory agencies at the Federal, State, and local level. Over the years a great deal of faith has been placed in the scientific and governmental establishments dealing with the use of x radiation. There has been a great deal of faith in the policymaking apparatus dealing with the development and promotion of peaceful uses of atomic energy. That faith has rested on ignorance. It has rested on as absolute a delegation of citizen responsibility to government and to professionals as has ever occurred in the history of the United States.

In the last few years the hazard of deploying faith based on ignorance has become increasingly apparent. It started with the very late revelation of the occupational risks to uranium miners; a hearing, which the Joint Committee on Atomic Energy finally held in 1967, bringing out facts which should have been brought out years earlier. This revelation was followed by a series of disclosures relating to medical and dental x-ray exposure in the United States Congress, preceded by a number of articles by a few health physicists and radiological technicians who spoke at their own professional peril.

The Radiation Control Act of 1968, supposedly put the Department of Health, Education, and Welfare into the business of setting standards for medical and dental x-ray machines and taking the lead in upgrading the performance of both technicians and medical personnel and used machinery; but that Act has suffered in its aftermath from the same kinds of deficient constituency and awareness that led to its enactment.

As far as we know, x radiation from medical and dental machines present the bulk of present radiation exposure to the American population. We know that dentists and doctors and their assistants handle these machines in a framework where the patient or the consumer is not expected - is not encouraged - to ask questions, much less to receive the answers about how well these machines have been checked, about how qualified are the operators of these machines, and about a number of other issues dealing with the use of these machines in diagnosis and treatment.

It has not been realized throughout the public that when it comes to radiation, ionizing radiation, the old saying that "every little bit counts" is directly applicable. Another phrase might also be applicable; that when it comes to this kind of radiation, "even if it doesn't pinch, it hurts."

Unfortunately, the public views trauma and other forms of industrialized violence largely as it has viewed street crime; if these do not provoke immediate sensory pain and anguish, they do not provoke public concern. Tornadoes and fires provoke immediate pain and anguish; low level radiation, with a few exceptions, does not. Radiation is a form of new and silent violence, at least as it comes from an industrialized economy, and not natural background. It is a new and silent form of cumulative violence that does not provoke immediate pain or anguish, therefore does not produce any immediate concerned constituency among the public. This means that our intellectual approach has got to be one that analyzes risks and probabilities and alternatives and remedies and that unlike street crime, it can not rely on a visceral and sensory response for the public's arousal and concern.

The medical and dental x-ray experience relating to the Radiation Control Act of 1968, I think alerted many people in this country that the assurances that had been given for years just weren't so. Instead, there is a disgraceful lack of systematic inspection, effective design, and of operating care; and the patients are exposed to ten times or more levels of ionizing radiation, unnecessary to fulfill the functions of the x ray in terms of taking a clear and adequate picture. This astounded many people because the professional corps had dissented very little up to that point. However, when this dissent began, the processes of Congressional hearings and legislation moved with almost incredible swiftness. That's a good lesson, perhaps, for health professionals to learn; that when knowledge is focussed on the Congress by people who have been working in these areas, who have not felt sufficiently free to be candid, that knowledge can be translated into policy awareness. I know no other institution in the U.S. Congress that has been more deprived, and that has delighted in being deprived of knowledge, of risks, probabilities, and alternatives, than the Joint Committee on Atomic Energy.

This abdication leads to the second section of my remarks relating to nuclear power plants. Nuclear fission power plants, fission; including the breeder proposal, have suffered the pain of a certain type of success. Whenever a new technology delivers its commercial objective (in this case, electricity), the risk of developing that technology in an imbalanced way increases when it relates to the costs to present and future generations of such a technology. It runs the risk of imbalancing the development of alternative technologies for energy because of its unquestioned success in producing electricity.

Once again the same pattern was repeated; a corps of professionals and government officials and later members of industry were built up around the promotion of nuclear power. The Atomic Energy Commission had the dual and conflicting role of promoting this peaceful use of atomic energy and safeguarding it at the same time. It embarked on a massive research and development project, benefiting from weapons research, as well as the nuclear reactor R&D program, and then transferred this knowledge and this hardware to the private utilities and the reactor manufacturers, directly and indirectly. Then the peculiar jargon of the atomic energy world began to be developed. In the 60's when questions were asked by the very few, the answers were "the risks are negligible," or "although there is a possibility of an accident, it is very, very unlikely to ever happen."

It is interesting to note that the jolt of the atomic energy establishment came almost accidentally from two sources: (1) Conservationists' concern over thermal pollution and (2) a statement by Dr. Ernest Sternglass about the number

of people, in terms of present and future generations, who would be seriously exposed to radiation from these plants. His estimates were considered so outlandishly wild that the Atomic Energy Commission commissioned Drs. John Gofman and Arthur Tamplin, members of an AEC laboratory, to refute him. In refuting him, they still came out with a level of risk estimate that was still considered outlandish, particularly by the Atomic Energy Commission.

It is interesting to know that those two controversies are no longer the most serious ones relating to nuclear power plants; that the controversies now have spread into almost every nook and cranny of this technology. What most provokes the AEC, the reactor manufacturers, and the utilities are questions by the public that have not been answered. The response of the Atomic Energy Commission to these questions has been filled with innuendo, insinuations, and sensationalism, and a great deal of secrecy. The AEC has not accepted a critical and cardinal foundation of our system of law - from the English common law to the present-day statutory law - that the burden of proof for going forward with a technology is on the promoter, not on the potential victims.

And so in the following areas we are faced with grave and unanswered questions and often grave and totally insupportable performances:

1. Power Plant Siting Policy. We have only to look to England to see how disastrous our siting policy has been in locating these plants in the suburbs and near large metropolitan areas. In England, I understand, the siting policy has been to locate nuclear power plants much further away from metropolitan areas. In Sweden, we have the reverse; there is even a proposal to build one of these plants in downtown Stockholm. Moreover, plants have been designed or are already built only a few miles away from major Swedish cities. Siting, a classic illustration of what happens when the government ignores the people in terms of their rightful role in decision making. They are the ones who have to live near these plants. They are the ones who will receive the most intense exposure in case of an accident.
2. Meltdown and Emergency Core Coolant System. This problem has received the most publicity; the problem of meltdown and emergency core coolant system. It is interesting to note that this issue was brought to public attention by a group of scientists, lawyers, and environmental citizens whose action led to the public hearings by the Atomic Energy Commission, which led to the first opportunity for a number of Atomic Energy Commission scientists to say what they should have said, and perhaps what they wanted to say publicly months, if not years prior, about the inadequacy of the Emergency Core Cooling System (ECCS) and the inadequacy of the safety and research program that was supposed to insure the ECCS's predictable deployment in an emergency.
3. Thermal Pollution. In this problem we have a very interesting conflict between State and Federal jurisdictions. I would expect a far more aggressive posture by the States in asserting their jurisdiction generally notwithstanding the recent Supreme Court decision denying it. That assertion may well come in the form of Congressional proposals as well as renewed State action.
4. Fuel Processing. On the question of the fuel processing plants, there has been probably less information publicly available than on the reactors themselves. Here the question of the transportation of radioactive materials is a critical one. A recent General Accounting Office (GAO) report noted a number of deficiencies dealing with the containerization and transportation practices. The GAO, as has been its tradition since the clampdown by Congressman Chet Holifield in

1965, does not name names. The GAO, however, does, and did in this instance, point to a number of unknowns, hazards, and deficiencies to which the Atomic Energy Commission should pay heed. But that, to me, is a drop in the bucket in terms of further inquiry by the Congress, hopefully, about the transportation risks here and the exposure of radioactive materials to waylaying nuclear highwaymen.

5. Waste Disposal. The problem of waste disposal is perhaps the most nagging technical problem of all. Once again, we have a classic illustration of going forward with the benefit of the technology and waiting and hoping and believing that the waste disposal problem will be solved sometime along the way. The containment of incomparably deadly materials such as Plutonium-239 from the environment for half a million years is a worthy task only if the society's survival is at stake. Instead, such waste makes society's survival the issue.
6. Earthquakes pose a problem which has plagued the utilities in California.
7. Sabotage and Theft pose a considerable risk.
8. Economic Costs of maintaining these plants are rising and causing concern among the utilities.

Witness the recent speech of Mr. Rodus, who is the President of Consolidated Edison in New York City and the more recent public discussion of the insurance of these plants. It is interesting to note that in our country's history, insurance coverage has always been considered a deterrent to hazardous practices in the sense that if the technology is too dangerous, it won't be able to get insurance. and if it can't get insurance, it would not operate. But, once again, the foresight of the nuclear power establishment led to the enactment in 1957 of the Price-Anderson Act, which limited the overall liability of a nuclear power plant accident to a current \$560 million level, with the private insurance participation under the \$100 million level. The inadequacy of this insurance coverage may be compared with a 1965 Atomic Energy Commission sponsored report (it was not released until this year), that a big accident in an average sized nuclear plant would lead to 45,000 deaths, over 100,000 injuries, and \$17 billion worth of property damage. Seventeen billion dollars worth of property damage is a long way from a limited \$560 million dollars that the Price-Anderson Act stipulates.

There have been throughout an increasing level of "leakage," not only of radioactive waste, but of Atomic Energy Commission documents. These documents have been showing that there have been people inside this world of atomic energy who have been very seriously concerned, but who have not felt free enough to speak out. The words "near misses" have occurred in these documents and, certainly, there is now quite a long list of "near misses," quite a long list of minor accidents that could have been big accidents.

It is perhaps instructive to our country that there would not be a single nuclear plant in operation today if it were left up to the free market. The nuclear technology would not have been developed without government (that, perhaps, is not too astounding, given the investment levels required). More significantly, however, is that these nuclear plants would not be in operation today without government interference via the Price-Anderson Act. As Commissioner Herbert Dennenberg of Pennsylvania, and the State's insurance department, said at recent hearings, and as Professor Harold Green also stated at those same hearings, "without the Price-Anderson Act, without the limitation of liability, no utility could afford to operate a nuclear power plant."

And so, the consumer pays going and coming. The consumer pays through his or her taxes for this \$30 billion R&D program developed since World War II, and, without adequate insurance coverage the consumer pays in the event of an accident.

This brings me to the subject of the health professionals. I think it could be said categorically that there would not have been a Radiation Control for Health and Safety Act of 1968 without possibly three health professionals participating, led by Dr. Karl Z. Morgan, then of the Oak Ridge National Laboratory. The technical information which broke through the barriers of fraternal secrecy and reached the public was absolutely a prerequisite for Congressional concern and action in this area. The Act has not worked well, but at least there is the authority on the statute books to make it work much better.

Why haven't we been hearing more from health physicists in all these areas, particularly nuclear plant operational risks? I think one reason is that they are not given enough decision making power at the plant level or in the councils of government. Bureaucratic leaders still consider them to be technical minions rather than coequal participants in fundamental and derivative decision making processes. The need to develop an independent professional base for health physicists then is critical; that is, independent of their occupational or employment base. They will not be able to speak and to participate according to their best knowledge, if they are restricted by contemporary organizational pressures, both corporate and governmental. I would urge that health professionals in the health physics community seriously consider establishing an independent, technical base of technology assessment and advocacy according to the highest canons of their professional mission and relating this work not only to nuclear plants, medical and dental x rays, but also to new consumer products that raise questions industry is not constrained to answer.

Now, in conclusion, the usual evaluation of nuclear power plants has been in a benefit-risk frame of reference with the benefit considered great and the risk "negligible." I think there are a number of areas we can all agree on verbally; whether we can agree in terms of action is another thing.

The first is that there is an intolerable level of secrecy surrounding this matter, which only recently has been broken by court decision, by deposition, by externally forced public hearings, and by information leaks. The suppression of the 1965 AEC estimate of damage from a nuclear power plant accident is a significant case in point of such secrecy, particularly the internal dialogue about how to release this information, whether to release it, how much to give to the Joint Committee on Atomic Energy, and so forth.

Second, we need a far more aggressive posture by the Joint Committee on Atomic Energy. Some people in the consumer and environmental areas believe that the Joint Committee on Atomic Energy has permitted such a deterioration in this area that it now has as its opportunity the prospect of saving this country. Nuclear reactor peril is, of course, of tremendous consequence to not only present but future generations. The Joint Committee might well heed Alfred Whitehead's memorable dictum when he counseled the scientific world to always have before them the option for revision -- the option for revision of theories or hypotheses.

At the present time, the Atomic Energy Commission, the reactor manufacturers and the utilities have not proved their case. Some might say they have only done so in a negative way. But, they have not proved their case, and the right of the consumer to have these questions answered so that the consumer realizes (1) what the risks are to himself and to future generations (he or she might care about their children and grandchildren) and (2) what the alternatives

are in terms of other energy sources, greater energy conservation and more explicit energy allocation; and he might also want to know what his participation rights are when a nuclear power plant or a waste disposal depot is proposed for construction under the licensing procedure.

Philosophically one might ask the following question: "Under what conditions should a society ever engage in the deployment of a technology which has to be perfect forever, such as a nuclear power plant, because the alternative is massive social disaster now and into the future?" In my judgment, the only condition when a society should engage in such a deployment is its utter survival, and nuclear power is not utter survival. Nuclear fission power is one approach. There are other approaches - solar and geothermal among them.

Perhaps the greatest cost of putting all our energy eggs for the future in one fragile nuclear basket is that the government has not deployed its billions in developing other options, whether these be geothermal, solar or until recently, fusion energy, or other alternatives. This is why I think the United States, as the leader in nuclear power development and sales, has got to rethink its programs; rethink how it allocates its tax dollars for developing other energy sources, and to rethink its obligation of aggressive sales of nuclear reactors with export bank financing to underdeveloped countries where the technical infrastructure is far, far less adequate to care for estimable risks from the siting to the waste disposal of radioactive materials.

I would like to conclude with one hope directed to Chairman Melvin Price of the Joint Committee on Atomic Energy. He is aware of my disagreements with Congressman Holifield, and I am sure he is aware that the Joint Committee has not opened up its hearing processes to consumer and environmental testimony as it now intends to do under his direction in October. As of January 1964, these hearings have neither been held nor scheduled. But, I would hope that if Chairman Price is not convinced by recent disclosures of the need to consider a "go-slow" program at the very minimum, that he will at least focus on the need to ask the tough questions of the Atomic Energy Commission and to demand the answers openly and on the public record for the scientific, environmental, consumer communities to scrutinize, to cross-examine and to follow up. The risk is not one to which only a selected few are exposed. It is a risk for mankind.