

CAN WE SURVIVE THE PEACEFUL ATOM?

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There is a reasonable segment of the thinking population which considers the environmental-ecologic fanfare a first-class cop-out -- a convenient diversion of anger over the injustices of racism, of poverty, of an idiotic dehumanizing war, of man's general inhumanity to other men. We have no doubt that this is a precisely correct diagnosis of the meaning of the lip-service paid to the "environmental crisis" by numerous politicians and others who indeed would like to have the heat taken off the issue of our national absence of any rational sense of priorities or values.

Today, however, we should like to point out, using atomic energy as a prime example, that the environmental crisis is not really a diversion from what might be regarded as truly important issues of our time. Rather, it is a manifestation of the ultimate retribution and irony that faces a society which, at best, can be charitably said to be free of a system of human values and, at worst, possessed of a grossly inverted set of values centering around human instant greed and human power over other humans. The irony aspect arises because no favored group will be able to find a plastic bubble in which to hide from the consequences of an unbridled Madison Avenue hucksterism bent upon the creation of products and diversion of energies into activities - both totally unrelated to worthwhile human needs and goals.

Optimism that we can survive is hardly justified. Yet, because hope springs eternal, it seems worthwhile to describe one of the most serious manifestations of the rape of the environment by what

may be called the ultimate pollution in the faint hope that yet another illustration of human folly might somehow brake our determined, head-long race toward disaster in the form of conversion of the earth to the stark, lifeless beauty of the Moon.

All of you know that the Atomic Era was ushered in during World War II with the development and use of atomic bombs. The newly-found ability to destroy life in a wholesale, efficient, inexpensive manner was indeed awesome. The Congress of the United States recognized this potential and, in what appeared a sound move, decided that the further development of atomic energy must be kept out of the hands of the military establishment. Thus, the Atomic Energy Act created a civilian Atomic Energy Commission and charged it with the dual responsibility of meeting the National Security needs in atomic weapons and at the same time of bringing to society all the benefits which nuclear energy must surely have in store. A last proviso was duly added, that all this should be accomplished with careful attention to the safety and health of the public. No doubt the motivation of the Congress was of the highest. The result, however, has been a fiasco of mammoth proportions. In retrospect one might say the outcome was predictable, but that is because of the enormous power of hindsight.

Several hopeless ingredients are now evident in the mix which has led to the present danger to life provided by the technology of atomic energy as developed under the aegis of the Atomic Energy Commission:

1. The same cast of characters held the responsibility for the **military** and "peaceful" aspects of the development of atomic energy.

Indeed, throughout the structure, people with their points of view, philosophy, and goals shuttled daily between the tasks of developing nuclear explosives for military purposes, testing such explosives, seeking out beneficial by-products of atomic technology, and protecting the health and welfare of the public.

2. The military aspects provided a wondrous cloak of cover for any stupidity, rashness, and lack of concern for human health and safety that could occur in this overall activity. Criticism of direction, of goals, of errors was easily silenced through the use of security classification and secrecy, and it is still so silenced.

3. A conflict of interest was inevitable for an agency, in this case the Atomic Energy Commission, charged with the dual responsibility for gung-ho development of a most treacherous technology and for simultaneous protection of health and safety of the public.

4. The stage was set for the creation of a bureaucratic super-agency of government, virtually free of many of the check and balance restraints that are requisite in a democracy.

And with the worship of the idol of growth, as exemplified in the Gross National Product, atomic energy developed the motto that "Good is up", no matter how this did or did not relate to societal or human needs. As with so many other aspects of the huckster philosophy, it was believed that somehow a mad rush to "more" would certainly help us on the road to the best of all possible worlds, even a "pollution-free world".

Two major commodities were available for exploitation in the atomic energy field:

1. Energy release, either explosively through nuclear bombs or controlled through nuclear reactors operating on the fission of uranium and other fissionable substances.

2. By-product radioactive substances in unbelievably copious quantities, ranging from those of extremely short life-time of existence to those continuing to emit radiation for hundreds or thousands of years.

Let us focus only on the "peaceful" developments of atomic energy based upon these two commodities, energy release and by-product radioactive substances. As a minor digression, let us also recall that radioactive substances emit ionizing radiations capable of instantly or slowly destroying virtually all forms of life, depending upon the dose of radiation received. And that such radioactive substances can irradiate living beings externally from their presence in the environment or internally after being ingested or breathed from such sources as contaminated food, water, or air.

Since "good is up" and "more" is "the American way", the Atomic Energy Commission pressed forward on all fronts to sell its two basic commodities in the widest possible fashion, as rapidly as it could.

The energy commodity it has promoted in two forms. The nuclear reactor, releasing the energy of uranium fission was groomed for the role of providing man and society with unlimited quantities of energy, primarily in the form of electricity. Electricity is, of course, obviously good, for who can deny the virtues of the light bulb. That the major use of electric power might be in industrial uses which

produce more pollution and garbage is conveniently set aside in the virtuous growing GNP philosophy.

The nuclear bomb, hydrogen or atom type, also releases copious quantities of energy, albeit a bit rapidly. Obviously, thought the atomic energy developers, such bombs have to be good for something, especially since no one was particularly enthusiastic about firing them off all over the landscape a la Hiroshima-Nagasaki. And so was born the wondrous child known as Plowshare - the "peaceful" nuclear explosive which would move mountains, divert rivers, create harbors, carve canals, loosen underground natural gas so it could become available, and do many other marvelous tasks for man.

For both forms of utilization of the energy commodity there were some nuisance-filled complications - the discriminate or indiscriminate release of radioactive substances into the environment where, directly or via access to man's food and air, radiation would be delivered to man and his ecosystem. But, it was reasoned, the rivers, the lakes, the atmosphere, the oceans, and the earth were all very large, and, hence, by the magic of dilution we could surely escape the consequences of pollution of the earth with long-persisting poisonous radioactive by-products.

The by-product radioactive substances were promoted with a vigor equal to that for the energy commodity. Industry could use strong radiation sources for many tasks, and medicine surely could use radiation sources and radioactive substances for the treatment, diagnosis, and study of disease. The curve of shipment of such radioactive by-products has risen steadily over the years, to the great satisfaction

of atomic energy promoters, for this meant obvious success of the endeavor. That some of the radioactive materials get lost in shipment, and irradiate unknown numbers of people in unknown places, was a minor nuisance. That the utilization of these radioactive substances meant the radiation of workers, of bystanders, and of medical subjects obviously could not be of concern, for the handling would, of course, be with great care and, in any event, it should be obvious that the benefits achieved must clearly outweigh the risks (even though neither was subjected to measurement or other scrutiny).

Oh yes, the last charge of the Congress to the Atomic Energy Commission -- accomplish the objectives with careful attention to the public health and safety. The hazard came from the ability of radioactive substances and radiation to kill humans. For a promoter of technology, such a hazard is, stated simply, an unmitigated nuisance standing in the way of "progress", and is to be dealt with as such. Three ingenious methods are available for dealing with such thwarts to technological progress:

1. Study the problem. Surely science and technology can develop satisfactory answers for everything, including the irreversible degradation of our environment by a pollutant that can never be cleaned up, even by the most devoted anti-litter campaigners.

2. Minimize the problem. This has several faces. First, the pronouncement is made that all aspects of life and living involve some risk - even getting out of bed. Second, we can't stand in the way of progress. Third, so there is some hazard, but surely the benefits are so wondrous as to outweigh the risk.

3. Develop the promoter's dream concept - the "tolerance" dose of a poison (radioactivity, in this case). How does this miraculous invention work? One starts with a nuisance that impedes technological progress - namely, a poisonous by-product of that technology. The first step is to determine what dose of the poison converts humans immediately from the vertical to the horizontal position, where they remain irreversibly. This dose is designated as above "tolerance". Give yourself a little leeway by setting the "tolerance" dose, say, five times lower than this lethal dose. The technology can now go forward unimpeded until the second step is reached. At some point in the technology, more and more humans become exposed to the poison, and it becomes evident that while they are not instantly converted from living to dead, they do still die from the exposure after a period of weeks, months, or a few years. Clearly, we are then ready for the second step. This step does not require great innovation, for it is simply a repetition of the first step. One simply arrives at the remarkable conclusion that a new "tolerance" dose is required, somewhere below the first "tolerance" dose. The key requirement in this promotional approach is never to ask the question, "Is there truly any safe tolerance dose?".

So the new "tolerance" dose is announced with much fanfare, duly proclaiming the undying devotion of the promoter to advancement of the technology with the greatest concern for human health and life. If the new "tolerance" dose is, let us say, 10 times below the previous one, two points can be guaranteed.

- a. Since it took a while to demonstrate the lethal effect of the old "tolerance" dose, it will take a longer time, in all likelihood, to prove it for the new "tolerance" dose.

- b. The technology can grow materially, and expose a much larger fraction of the population to the poisonous by-products for quite a period of time.

This overall cycle can be repeated as many times as are required, provided no one interferes or raises embarrassing questions. Finally, the technology is in full bloom. Its wondrous benefits are brought to every remote hamlet. The industry has grown on a steadily rising curve - the full realization of the American dream. That by now essentially the entire population has been exposed to the by-product poison, that cancer, leukemia, fetal deaths, genetic deformities and deaths have become quite prominent as a result, that the environment is irreversibly contaminated for all future generations (if indeed any can be produced) - all these can now come as a complete surprise. For surely the technology has been promoted with the greatest of care, with due consideration of health and safety of the public via the magic concept of the "safe" or "tolerance" dose of the by-product poison. Even at this point it is highly doubtful (and of course inconsequential) that the promoter will think to question the wisdom of the "tolerance" dose approach.

In the case of atomic energy development we haven't quite reached this final, irreversible disaster point, although no thanks are due the Atomic Energy Commission for this. What has happened is that during the post-World War II years, a number of elegant scientists, such as E. B. Lewis and Linus Pauling, began to question the eminent wisdom of the "tolerance" dose approach, and to point out that, in all likelihood, there exists no safe dose of radioactivity. Expressed very simply, they suggested that every dose of radioactivity would produce its

share of leukemia, cancer, and irreversible degradation of the genetic pool of humans, with all its future untold misery and death.

Faced with the obvious danger of such a view to the future progress and growth of the technology, the atomic energy proponents had two major trump cards to play. First, one discredits the concept of no safe tolerance by impugning the motives of those who raise questions. In the cold war era of the 1950's and 1960's this approach worked miracles, for it was obvious that anyone who questioned the wisdom of the Atomic Energy Commission's activities must be a witting or unwitting dupe of the Bolshevik conspiracy. The second trump card lay in the wise development of the first approach to coping with technological thwarts to technical progress - namely, "Study the Problem". The Atomic Energy Commission had carefully nurtured this approach by setting up a Division of Biology and Medicine which generously supported numerous laboratories to study the problem of hazards of radioactivity to man. The scientists, so generously supported, could be counted upon either (a) to say nothing concerning hazards, or (b) to make pious pronouncements that radioactivity was being studied and understood better than any other environmental hazard, or (c) to deny the hazard by a variety of platitudes and irrelevancies. The scientists performed these tasks well.

To say that no good biological research was accomplished by the Atomic Energy Commission scientists would be grossly false. A great deal of excellent, important work was accomplished. Indeed, from such work, it is possible to demonstrate that the whole "tolerance" approach is incorrect. But one has to extract the information from such work; it is not proclaimed either by the Atomic Energy Commission or the vast

majority of the scientists it supports. The reason for the silence of the scientists is not hard to find. Negative information hurts the technology. If the technology is thwarted, the Congress cuts appropriations. If appropriations are cut, the research by the biological scientists isn't supported. This is obviously unacceptable. And, therefore, scientists are silent.

Recently we have investigated the implications of the tolerance dose concept in atomic energy development, utilizing the current legally established value for the population. We arrive at the following conclusions, based upon human evidence already at hand:

1. There simply is no evidence even remotely suggesting any safe or tolerance dose of radioactivity or radiation.

2. The current legally established "tolerance" dose if received by everyone in the USA from any combination of sales programs of the Atomic Energy Commission would lead to one extra case of cancer plus leukemia for every ten that occur spontaneously. For the population of the USA this would amount to 32,000 extra cancers + leukemias per year. Over and above these deaths, there would be additionally a large, as yet undetermined, number of genetic deaths annually plus a large number of deaths from causes other than cancer + leukemia.

3. Viewed overall, this tremendous burden of suffering and death would represent a public health setback roughly equal to the combined advances of all types in public health over the past 25 years.

4. All this has been made possible by the assignment to one super-agency of government, the Atomic Energy Commission, of the dual role of huckstering the commodities it has to sell while at the same time doing everything possible to protect the public health and safety.

If this "tolerance" dose concept for a poison in the hands of a promoter of technology can lead to such dire results in the degradation of human health, its hereditary pool of genes, and its environment in an irreversible fashion, it would seem reasonable to suggest that Earth Day is an appropriate time to understand how this phenomenon has led to our environmental crisis and to suggest constructive preventive action for the future. And because Earth Day should be the beginning of action for the future of a livable world, we wish to suggest urgent action each of you can take by informing your legislators in the U.S. Congress of the following needs.

1. Outlaw the concept of a "tolerance" dose of any by-product poison of new or existing technology. If the promoters of a technology believe a safe "tolerance" dose exists, let them prove it conclusively to lift the ban for their particular poison.

2. Abolish the dual role of promoter and protector for any agency, governmental or otherwise. Since the Atomic Energy Commission is a prime offender, it should be stripped of all functions having anything to do with public health or safety.

3. Establish the rational principle that the only proper tolerance dose of any poison, radioactive or other, is zero, as a result of technology promotion and development

4. It might be thought that establishment of a zero tolerance dose of a by-product's poison will mean the end of technological advancement. This is sheer nonsense, and is not being advocated. What is being suggested is the institution of a new principle of technological development - the principle that pollution of humans and the environment represents an issue of the highest importance to humans and is a privilege to be negotiated with the most careful deliberations. The prospective polluter should, for the first time, be asked to prove his case in favor of polluting, rather than for the prospective human victims being required to produce the corpses that will result from the introduction of the poison.

The prospective polluter should, therefore, be required to present:

a. Concrete evidence of the benefit of his pollution in terms of number of lives saved or improved.

b. Concrete evidence of the hazard of his pollution in terms of lives to be lost through his pollution.

c. If the prospective polluter can demonstrate neither the concrete benefits nor the concrete risks, he and his technology should be advised to go back to perform the necessary homework.

d. If the evidence is presented, then the fullest possible public deliberations and hearings should be held, with all segments of the community, scientific and non-scientific, having an opportunity to consider the evidence.

e. The public directly, or through its elected representatives, should then vote whether or not the specific pollution, at a specified level, should or should not be allowed.

Radioactivity pollution as a by-product of atomic energy development is a prime example of the erroneous approach of the past - an approach which can lead to health and ecological disaster. There are numerous other possible examples - indeed just about every by-product poison has been handled in an equally erroneous fashion. If an erroneous approach for radioactivity can lead to the prospect of wiping out 25 years of public health advances, it is not hard to see that an erroneous approach for the large combination of technological by-product poisons can do much more than wipe out public health advances. Indeed, the result can easily be wiping out the public.