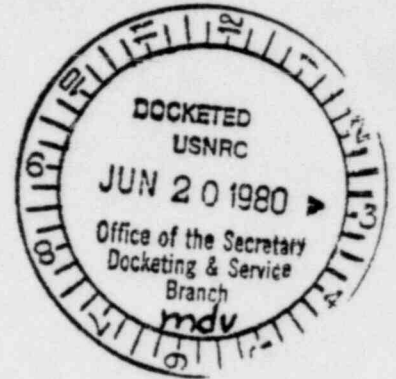


PLENTY

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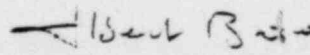


Samuel Chilk
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Dear Sir:

Please find enclosed the comments of
PLENTY on the proposed revisions to 10
CFR 20 published in 45 FR 18023.

Sincerely,


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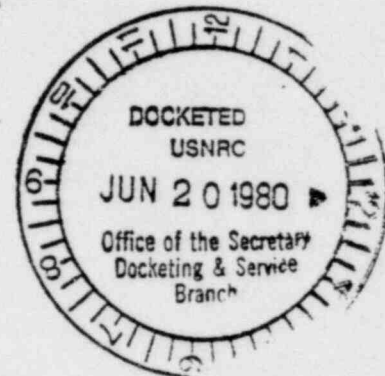
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THE GENETIC IMPLICATIONS OF INFORMED CONSENT

Albert Bates

June 16, 1980

Comment on NRC Proposed Revisions to 10 CFR 20



(615) 964-3574

BEFORE THE UNITED STATES
NUCLEAR REGULATORY COMMISSION

THE GENETIC IMPLICATIONS OF INFORMED CONSENT

Comment of Albert Bates

Ethos Research Group

For PLENTY, Summertown, TN 38483

On Proposed Revisions to 10 CFR 20

The revision of 10 CFR 20, which sets the standards for radiation protection activities for Nuclear Regulatory Commission (NRC) licensees is long overdue. In the setting of those guidelines, the NRC has a unique and important responsibility. While organizations such as the International Commission on Radiation Protection (ICRP), the United Nations (UNSCEAR), the National Academy of Sciences (BEIR), and the Environmental Protection Agency (EPA) have important insights to offer in the design of a radiation protection philosophy, the NRC must ultimately set the standards "in concrete and steel" and bear the duties and obligations of the government of the United States to citizens, foreign nationals, and state and foreign governments. The Congress has left general policy in this area to the NRC to set as it sees fit.¹ The Supreme Court has ordered the judicial branch to defer to the assumed expertise of the executive agency and not to intervene.² Upon the NRC, therefore, falls the burden of setting a policy which recognizes and protects the civil and human rights of people throughout the world, over vast time-spans involving unpredictable population patterns and uncertain technical sciences.

In setting standards the NRC must take into account the body of international human rights law, including, but not limited to, the United States Constitution, the United Nations charter, declarations, and covenants, the Helsinki Agreement, the Teheran Proclamation, the American Declaration of the Rights and Duties of Man, the Nuremberg Principles, and other human rights conventions and treaties.³ For this reason, PLENTY, an international non-profit charitable relief and development corporation, providing human rights expertise as a Non-Governmental Organization to the United Nations, has commissioned Ethos Research Group to provide PLENTY's recommendations to the NRC staff in the development of radiation protection policy.

I. NRC's STATEMENT OF PURPOSE

Adequate Protection

In its opening paragraph, the proposed revision would state as a general purpose that NRC standards should "provide adequate protection of the health and safety of workers, individual members of the public and the population in general." The existing regulatory wording has the purpose of the regulations to "establish standards for protection against radiation hazards"

A troublesome change of wording in the revision is "adequate protection." Other words which have had similarly troublesome application are "acceptable protection," "acceptable degrees of risk," "reasonable assurance of protection," and like usages. The problem with these terms lies in their ambiguity; what is "adequate," or "acceptable," or "reasonable" in terms of radiation protection for populations?

In a speech in Knoxville, Tennessee, on April 8, 1980, Commissioner Joseph M. Hendrie lamented:

"Our statute says that we shall regulate in a manner that provides adequate protection for the public health and safety and then offers no further guidance on what that is to mean. Over the years we have developed a substantial body of regulations and staff guidance documents, generally prescriptive in nature, that we believe constitute in sum a definition of adequate protection. But we have never managed over the years to resolve the philosophical problem of regulating an evolving new technology against a safety standard that seems to set a single relatively inflexible line Also it is clear that a more quantitative description of what constitutes adequate protection would be a benefit to us and to those who have to meet that standard The guidance we have had from Congress in assorted hearings over the years, going back to the beginning of regulation as a separate staff function of the Atomic Energy Commission, has ranged from a view that any new requirement is too much to a view that everything is not enough, and all shades in between. We continue to receive from the various Subcommittees of the Congress that instruct us a spectrum of views that broad."4

On several separate occasions in 1951, the AEC met to discuss the potential radiological safety hazards of continental nuclear weapons tests. At a meeting of the Commission on April 30, 1951, the possibility that underground tests in the continental United States would create unacceptable radiological hazards was discussed. Because of the uncertainties of the weapons sciences at that time and the priorities of the military in national defense, the AEC reluctantly agreed to tests of devices, on the order of one kiloton, underground. However, at the vigorous urging of the Department of Defense (DoD), within a few months time the AEC had capitulated to atmospheric tests, of greater magnitude and of more severe radiological impact, involving combat troops and civilian exposures, and even providing for deliberate over-exposure should the shot commanders demand that. This decision came in spite of the fact that the ICRP and NCRP had,

in 1951, formally adopted the "no-threshold" hypothesis and the AEC had set a standard for its own (informed and consensual) occupational exposures at a fraction of that which it allowed for (deceived and involuntary) exposures of troops.⁵ On balance with the foreseen defense need, the protection at the Nevada Test Site was deemed by AEC "adequate". Yet, some thirty years later many of the participants and civilian radiation victims do not regard the protection of that era as having been "adequate" and there is a body of current Congressional and technical reports to support this view.⁶

What is "adequate protection"? Is it a definable term? Does the definition of "adequate protection" remain unchanged over time? If not, are future persons bearing genetic injuries "adequately protected" by the standards at the time of the radiation impact or release? Are not future peoples entitled to a standard of "adequacy" of their own devise?

A less equivocating statement of purpose would merely state "protection" as a goal of regulation. "Protection" implies neither absolute protection nor de minimus protection. It is the plain and simple purpose of the standards to protect. Therefore, let us not equivocate from the outset.

Readily Inspectable

To ensure enforcement, the NRC staff proposes that the standards should be easily amenable to compliance verification by inspection; that the regulations should be "readily inspectable and enforceable."

This policy reveals a lack of appreciation for the potential hazards of radiation at low levels--below natural background. The statement in the proposal is that of someone who is trying to enforce a standard and wanting the job to be a little easier rather than that of someone who fully understands the nature of radiation and desires to provide thorough-going protection from involuntary exposures or consequences.

The job of monitoring harmful levels of radiation may not always be easy, although it may be considerably easier than measuring other environmental toxins. By way of example, suppose that the Commission wanted the assurance that workplace exposures would not cause unrepaired marrow damage in workers. Human studies of marrow damage at low doses of radiation are not available, so extrapolation from radiation tests on laboratory animals would be required. Recent laboratory work (see enclosure 1) indicates that rats sustain chronic and unrepaired marrow damage from 150 mR single exposures and possibly from lower cumulative exposures.

If marrow damage can be expected at single dose levels of 150 mR, then levels of emissions well below natural background may have to be measured in the workplace. (The suggestion that below background levels may have deleterious effects on health is consistent with the most recent BEIR Report.⁸) Yet, measure-

ments in this range--0.003 to 0.01 mR/hr--are not what one would call "readily inspectable."

Summary of Purpose

Both the terms "adequate protection" and "readily inspectable" can be dropped from the statement of purpose, since they are non-essential to the general purpose for having standards. A suggested restatement is:

The NRC standards for protection against radiation should identify specific quantifiable and procedural requirements, and their bases, that will provide protection of the health and safety of workers, individual members of the public, and the general population of present and future eras. NRC standards should be consistent with the applicable federal radiation protection guidance and include consideration of work of recognized national and international advisory organizations. The standards should be structured in a manner that is easily understood and can be readily revised to accommodate legislative and technical changes as necessary.

II. ESSENTIAL ELEMENTS

Assumptions

For a number of years now, including most of post-World War II period, the federal government has assumed that radiation at low doses was without threshold for effect and that the degree of effect in humans at low doses was linearly proportional to the effects observed at high doses in laboratory animals. The underlying rationale for making this assumption of a linear dose-response function was to take the most conservative stance to provide the maximum protection for the public health.

This original rationale has vanished in the last decade. There is now a considerable body of scientific literature--theoretical, experimental, and epidemiological--which argues variously for a linear relationship, a sublinear relationship and a superlinear relationship in the range of exposures well below that level at which absolute proof is ever likely to occur.⁹

The rationale which has supplanted the original is that since radiation has demonstrated differing response curves according to the character of the radiation, exposure, and the tissue exposed, and since some radiation is linear, some sublinear, and some superlinear, it is reasonable for prediction purposes at average, mixed-character dose-levels from which the function is unknown, to assume a linear hypothesis.

It is both reasonable and conservative to assume that radiation is without threshold between dose and the probability of an effect. But the assumption of linearity, while reasonable, is not necessarily conservative. To attempt to take the most conservative stance now, in the 1980's, one would have to assume that all levels of radiation--even extremely low levels within the range of background--contribute to all non-accidentally induced morbidity and mortality. Therefore a most-conservative statement of dose response might be: the maximum effect of any increment of radiation over that already existing in the environment is that it will be fatal to someone. Actually, this merely restates the existing rule in a more readily cognizable fashion.

A basic assumption not discussed in the proposed revision is the assumption that genetic injury occurs in humans. As has been frequently stated by NRC publications,¹⁰ genetic effects have not been observed in studies of exposed humans. However this is due more to a longer regeneration rate in the human population (20 to 50 years) than strictly to the absence of an effect. In 1976, the cities of Hiroshima and Nagasaki reported to the United Nations that the Radiation Effects Research Foundation, formerly the Atomic Bomb Casualty Commission, had found no definitive proof that genetic effects of atomic radiation had appeared in the offspring of the atomic bomb survivors some thirty years after the holocaust. Said the cities report: "There is the possibility of genetic mutations being induced in the children of atomic bomb survivors by the atomic bomb radiation. The induced mutations appear additively to the spontaneous mutations every human being has the possibility of developing . . . Extensive and accurate studies and researches will be required hereafter."¹¹

In June of 1979, the Interagency Task Force on the Health Effects of Ionizing Radiation, Work Group on Science, reported "For reasons already discussed, very little direct information exists concerning human genetic effects following irradiation, although extensive experimental work with short-lived species has provided an indirect means for projecting human risks."¹² This is in general agreement with the 1972 BEIR statement: "For genetic effects of radiation, we have no direct evidence of human effects, even at high doses. Nevertheless, the animal evidence is so overwhelming that we have no doubt that humans are affected in much the same way."¹³

In 1979, the BEIR Committee amplified the earlier warning by flatly concluding: "In contrast with induced somatic effects, which occur only in the persons exposed, induced genetic disorders occur in descendants of exposed persons and can often be transmitted to many future generations."¹⁴ (Summary and Conclusions at p. 8)

It is therefore appropriate that the NRC should assume, for the same reasons that it assumes an absence of threshold, that genetic effects will occur in later human populations from individual exposures in the present era. Radiation protection philosophy should be based upon this assumption.

Principles

Corollaries which can be derived from the assumptions the NRC has made include the positive net benefit principle (#1) and an ALARA principle (#2), but an appropriate circumstance rule (#3) and an informed consent rule (#4) are deficient as stated in the NRC staff proposal.

Appropriate Circumstances

What are the appropriate circumstances for an individual to exceed selected limits? Certainly the Army shot commanders thought the circumstances were appropriate at the Nevada Test Site in the mid-1950's. Who decides on the occasion? The proposed rule is best edited to read: "The dose-equivalent to individuals shall not exceed the set limits." Emergency or life-threatening circumstances can be more closely defined and specifically exempted in the text of the regulations.

Informed Consent

Persons occupationally exposed to radiation should be fully informed of all potential risks of that exposure. So much for the somatic effects in the worker population. However, the concept of informed consent can extend only as far as the exposed generation, and therefore does not address the genetic impact. Because this is a knotty ethical issue which goes to the heart of the controversy over radiation technologies, considerable care will be taken to address this point.

III. GENETIC IMPERATIVES

If one adheres to the ethical reasoning behind the concept of informed consent, and one extends the standards for the protection of the present population to include at least equal or greater degrees of care to the well-being of future people, then one must also require informed consent by future people or, in the alternative, eliminate the potential for future harm.

In biomedical experimentation, informed consent is already a requirement of law. Federal insitutions are obligated to obtain written, informed consent whenever they propose to place any subject at risk. Exculpatory clauses are forbidden.¹⁵

This principle derives from the history of human rights law and was specifically codified to apply to the United States under international law by the Nuremberg Tribunal. Under the terms of existing treaties and obligations of international law, the United States is forbidden to experiment on living human beings in any way without first obtaining their informed consent. Under the United States Constitution, the prohibition on human experimentation may extend even farther, since some natural rights--such as life and liberty--are deemed to be God-given and "unalienable", beyond even the capacity of mere humans to consentually surrender.¹⁶

According to the 1972 BEIR Report, 943 dominant and 783 recessive diseases may be caused by radiation-induced mutations. According to the BEIR Committee, "the spectrum of radiation-caused genetic disease is almost as wide as the spectrum from all other causes."¹⁷ The BEIR Committee reported that the genetic commitment from radiation exposures in the present era may only be removed by gene extinctions--the genetic deaths or non-reproductive lives of individuals who carry the mutations. Said the 1972 report:

"A genetic death may be the death of an embryo so early that no one ever knows about it, or it may simply be the failure to reproduce. On the other hand, it may be a lingering, painful death in early adult life that causes great distress to the person and his entire family."¹⁸

That the genetic issue is in the nature of a massive human experiment, the BEIR Report left no doubt:

"There is danger that the previous sections, by concentrating only on fairly well defined genetically-associated diseases, have dealt with only the exposed part of the iceberg. What about the rest of human illness? It, too, has some degree of genetic determination."

"We remind all those who use our estimates as a basis for policy decisions that these estimates are an attempt to take into account only known, tangible effects of radiation, and that there may well be intangible effects in addition whose cumulative impact may be appreciable, although not novel."¹⁹

An individual worker may consent to an exposure to radiation, assuming that he understands the risks involved and considers the risks outweighed by other factors. If the worker then has a child, however, the child will also bear the risk of the exposure. The child did not consent to bear that risk. If the worker has two children, and each of those children marries and has two children, who marry and have two children, and so on, the bearers of the genetic risk multiply. By the tenth generation there are 2,048 bearers of the risk. By the twentieth generation there are 2,097,152 bearers. Current BEIR estimates, which are admittedly incomplete, suggest that for 500,000 persons occupationally exposed to 1 rem per year for 20 years, there will be 1,200 to 30,000 excess human hereditary disorders per million live births in their offspring. If one assumes no intermarriage with like-damaged individuals, in ten generations the hypothetical half-million worker population used in this example would procreate 614,000 to 15,360,000 living children with hereditary disorders and 46,080 recognized miscarriages as a result of the parent generation exposure.²⁰

Do those children have a birthright, which is inalienable?

U.N. Charter

The United Nations Charter is the first international instrument in recent times that has attempted to define and preserve natural rights. The charter is both the constitution of the United Nations and is also a multilateral treaty to which all U.N. member states--including the U.S.--are parties. The preamble and seven of the 111 articles of the U.N. Charter deal with human rights.²¹ (Art. 1, 13, 55, 56, 62, 68, 76.) Most important are the commands to states-parties in Articles 55 and 56 to actively promote human rights. This obligation is legally binding under international law because it is embodied in a treaty--the U.N. Charter--which the member states have ratified. Therefore no U.N. member-state may validly assert that it is free, as a matter of international law, to violate fundamental human rights.

This was historically an important departure for U.S. policy, as well as for the foreign policy of many other countries. Prior to 1945, the human rights of domiciliaries were deemed under international law to be within the domestic jurisdiction of the state. This meant that, with minor exceptions, nations did not have an international legal obligation to respect human rights of residents within their borders and could not be called to account by an international body or by other nations for violating such rights.

Opponents of this new foreign policy went so far as to introduce a proposed amendment to the U.S. Constitution which, if adopted, would have ensured, among other things, that no international human rights treaty concluded by the U.S. could override inconsistent state or federal laws unless an Act of Congress so provided. President Dwight Eisenhower obtained the defeat of the proposal in Congress by renouncing United States participation in the international human rights instruments which the U.S.--among a small number of forward-looking countries--had been so influential in securing.

But following the defeat of the amendment, Presidents Kennedy, Johnson, Nixon, and Carter reversed the policy of the Eisenhower Administration and declared U.S. adherence to international human rights conventions as a matter of official policy.

The U.N. Charter does not contain a human rights definition or a list of "human rights and fundamental freedoms." The human rights provisions of the Charter are "elastic" clauses in the sense that they apply to whatever specific rights and freedoms the U.N. defines through subsequent action and measures. The U.N. Charter is specific, however, in proclaiming the principle of non-discrimination in the enjoyment of "human rights and fundamental freedoms."

Among the international instruments to which one must look to determine what specific rights are now incorporated within the meaning of the Charter are the *Universal Declaration of Human Rights*, the two *International Covenants on Human Rights*, the *Genocide Convention*, the *International Convention on the Elimination of All Forms of Racial Discrimination*, and other multilateral treaties, such as the *Helsinki Agreement*, the *Teheran Proclamation*, and the *American Declaration of the Rights and Duties of Man*.

The Universal Declaration

The Universal Declaration of Human Rights was adopted unanimously by the U.N. General Assembly on December 10, 1948. As a statement of principle of human aspirations, the Universal Declaration ranks with the Magna Carta, the French Declaration of the Rights of Man, the American Declaration of Independence, and the U.S. Bill of Rights. The Universal Declaration deserves to be compared with these documents, if only because it is the first comprehensive codification of internationally recognized human rights. Yet the mark of the preceding milestones is unmistakable:

"All human beings are born free and equal in dignity and rights."

"Everyone has the right to life, liberty, and the security of the person."

"Everyone has the right to recognition everywhere as a person before the law."

"Everyone is entitled to a social and international order in which the rights and freedoms set forth in this declaration can be fully realized."

Among the economic, social, and cultural rights proclaimed by the declaration, Article 22 includes:

"Everyone, as a member of society. . . is entitled to realization, through national effort and international cooperation and in accordance with the organization and resources of each State, of the economic, social, and cultural rights indispensable for his dignity. . . ."

But perhaps the most important provision of political rights conferred by the Universal Declaration is the clause in Article 21, which proclaims:

"The will of the people shall be the basis of the authority of government."

It is the free will of individuals, a natural right of birth, which grants governments their powers and duties. Any action which limits the free will birth-right, of either present or future peoples, is therefore an infringement on the human rights secured by the Universal Declaration.

The Declaration recognizes that the rights it proclaims are not absolute but permits nations to limit the exercise of fundamental rights only where the sole purpose of the limitation is to secure recognition and respect for the rights and freedoms of others (such as imprisonment for offenses) and of meeting "the just requirements of morality, public order, and the general welfare."²³

Over the years there has been considerable debate among international lawyers and jurists about the legal force of the Universal Declaration. Since it is not a treaty and was adopted in the form of a non-binding resolution of the U.N. General Assembly, some governments and lawyers have contended that it has no legal force. Others have argued that the Universal Declaration is an authoritative interpretation or definition by the U.N. member states of the "human rights and fundamental freedoms" which, under the Charter, member states are under a legal obligation to promote. The latter view has, over the years, gained wide acceptance among international lawyers and, in theory at least, among a majority of governments. Among numerous official statements substantiating this conclusion are the Proclamation of Teheran and the Helsinki Agreement. The Proclamation was adopted at the United Nations International Conference on Human Rights which met in Teheran, Iran, in 1968 and was attended by 100 nations. The Proclamation declares:

"the Universal Declaration of Human Rights states a common understanding of the peoples of the world concerning the inalienable and inviolable rights of all members of the human family and constitutes an obligation for the members of the international community."

This Proclamation has been repeatedly reaffirmed in and by the United Nations.²⁴ The United States most recently reaffirmed its support through the Agreement which it made at Helsinki, Finland, in 1975, with 34 other nations. Article VII of the Helsinki Agreement provides:

"The participating States will act in conformity with the purposes and principles of the Universal Declaration of Human Rights. They will also fulfill their obligations as set forth in the international declarations and agreements in this field. . . ."

The International Covenants on Human Rights

The Covenant on Economic, Social and Cultural Rights and the Covenant on Political and Civil Rights were formally adopted by the U.N. General Assembly in December, 1966, eighteen years after the U.N. began to draft these treaties. Another decade passed before thirty-five states (the number required to bring both Covenants into force) ratified the adoption. The International Covenants were entered into force in early 1976.²⁵

Both Covenants have a number of common substantive provisions. Three of these deal with what might be called "group" or "collective" rights as distinguished from individual rights. Article 1 of both Covenants proclaims that "all peoples have the right of self-determination." Both Covenants bar discrimination on the basis of race, color, sex, language, religion, political or other opinion, national or social origin, property, or birth.

The Genocide Convention

The U.N. Convention on the Prevention and Punishment of the Crime of Genocide was adopted by the General Assembly in 1948 and entered into force in 1951.²⁶ It has been ratified by approximately 80 countries. The brutal policies of Nazi Germany were the primary reason the Convention was adopted. The Convention defines genocide as "any of the following acts committed with intent to destroy, in whole or in part, a . . . group as such" including deliberately inflicting on the group conditions of life calculated to bring about its physical destruction in whole or part. The Genocide Convention leaves punishment of offenders to national courts.

The Nuremberg Principles

The Nuremberg Principles are those general maxims of international law which were derived during the prosecution of Nazi war criminals after World War II. The Principles were subsequently formulated by an International Law Commission in June of 1950 at the request of the United Nations and ratified as international legal requirements by the United Nations in General Assembly Resolution 95(I).²⁷ The Principles define murder, extermination, involuntary experimentation, enslavement, and other inhuman acts done against any civilian population as "crimes against humanity." Complicity in the commission of a crime against humanity is made a crime under international law. The fact that internal law does not impose a penalty for an act which constitutes an international crime, or the fact that the person committing the act serves as a responsible government authority or acts under the orders of a superior, does not relieve the actor of responsibility under international law, provided a moral choice was possible to him.

Under these principles, not only might atomic workers who consented to harm their posterity be liable to prosecution for crimes against humanity, but the government officials who acquiesce in the human experiment might also become liable to imprisonment or execution.

IV. CONCLUSION

Informed Consent Revisited

Persons occupationally exposed to radiation should be fully informed of the potential risks of that exposure. However, since some individuals are of child-bearing ability and since radiation exposures can be expected to result in latent effects in future generations, the informed consent of the forebearer does not adequately protect the birthrights of his posterity. Prospective future members of society have human rights which must be protected. Therefore when occupational exposures are likely to result, an age or sterility restriction should be a prerequisite as well as the informed consent of the persons exposed and compensation for somatic injury.

Additions to the proposed principles authored by the NRC staff should include:

- (5) No person who consents to occupational exposure to radiation should be permitted to pass potential damage to future generations who cannot consent to bear that risk.
- (6) No man-made or man-concentrated radiation should be imposed upon any member of the public without their informed consent. Because of the inability to obtain the consent of future generations and because of the potential for latent genetic damage, all exposures to fertile or pre-fertile persons or the general population should be avoided.

(7) When accidental, non-consensual exposures to the general public occur, every effort must be made to minimize the risk that harm will occur to those who have not consented to bear the damage, including future generations.

While consideration of special groups having greater sensitivity is important in reducing occupational risks, fertile men, pre-fertile men and women (children), and pregnant women should not be excluded. There is also substantial evidence that genetic screening of the type suggested by Bross, et al.²⁸ would be well advised for occupationally exposed groups.

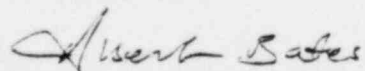
Standards for the General Public

It follows from the foregoing discussion of genetic effects and human rights that it should not be permissible for persons in this generation to consent to radiation exposures which will almost certainly damage later generations. Consequently in a virile, fertile, general population which can be expected to continue reproduction, much of the proposed rule does not provide the degree of protection which is really morally required.

Numerical dose limits, ALARA, derived standards, release of contaminated materials for unrestricted use, and unrestricted burial of radwastes or non-radwaste classified radioactive materials are inappropriate. Siting considerations are appropriate insofar as they further the goal of avoiding exposures to the public. Emergency dose levels are appropriate insofar as they mitigate accidental exposures to the general public. But planned exposures are a violation of human, constitutional, and natural rights.

For a more thorough-going statement of the underlying philosophy of these obligations discussed here, an earlier comment on the EPA proposed risk-assessment criteria, *Radwaste and Freewill, Government's Dilemma*, is enclosed. Reference is also given to R. Webb, *The Accident Hazards of Nuclear Power Plants*, Chapter 13, 'Who Should Decide' (University of Mass. Press, Amhearst, 1976), and J.W. Gofman's excellent treatise, *An Irreverant, Illustrated View of Nuclear Power* (Comm. for Nuclear Responsibility, San Francisco, 1979).

Respectfully submitted this 16th day of June, 1980



Albert Bates
Ethos Research Group

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1. See Hendrie speech (cited in note 4) and generally, *Nuclear Regulatory Commission Authorizations for Fiscal Year 1980*, Hearings before the House Subcommittee on Energy and the Environment, Feb-Mar, 1980.
2. *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council*, 435 U.S. 519, 55 L. Ed. 2d 460, 98 S. Ct. 1197 (1978).
3. Including the protections of basic natural rights evolved in the *Magna Carta* (1215), the *Statutum de tallagio non concedendo* (1297), the *Petition of rights* (1628), the *Bill of Rights* (1689), the *Declaration of Rights* (1774), the *Declaration of Independence* (1776), the *United States Constitution* (1787), the *U.S. Bill of Rights* (1789), the *Declaration des Droits de l'Homme et du Citoyen* (1789), the *Treaty of Paris* (1889), the *Covenant of the League of Nations* (1919), the *Convention de sauvegarde des droits de l'homme et des libertes fondamentales* (1950) and more ancient principles found in the Babalonian, Assyrian, Hittite, Vedic, Chinese, Mosaic, Judeo-Christian, Greek, and Roman laws.
4. 6 NRC News Releases 18:6, Speech no. S-6-80.
5. NCRP #59; see also Uhl and Ensign, *G.I. Guinea Pigs*, (Playboy Press, Chicago, 1980) pp. 27-29, and *Veterans Claims for Disabilities from Nuclear Weapons Testing*, Hearing before the Committee on Veterans Affairs, June 20, 1979.
6. *Ibid*; and *Health Effects of Low Level Radiation*, Joint Hearings of the House Subcommittee on Oversight and Investigations and the Senate Subcommittee on Health and Scientific Research (Vols. I & II), 1979; and *Effect of Radiation on Human Health*, Hearings of the House Subcommittee on Health and the Environment (Vol. I, 1978).
7. "Marrow Damage Linked to Low Dose Radiation", *Occupational Health and Safety*, May-June, 1979, p. 30.
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9. National Academy of Sciences, *Nuclear Radiation, How Dangerous Is It?* Academy Forum, Sept. 27, 1979; Environmental Policy Institute, *Proceedings of a Congressional Seminar on Low Level Ionizing Radiation*, 1976, and *Radiation Standards and Public Health, Proceedings of a Second Congressional Seminar on Low Level Ionizing Radiation*, 1978 (317 Penn Ave SE, Wash. D.C. 20003).
10. e.g.: Draft Regulatory Guide OH-902-1, May, 1980.
11. Cities of Hiroshima and Nagasaki, "Appeal to the Secretary General of the United Nations", 1976, p. 48.
12. Interagency Task Force on the Health Effects of Ionizing Radiation, Report of the Work Group on Science, July 1979, p. 48.
13. BEIR Committee, *The Effects on Populations of Exposure to Low Levels of Ionizing Radiations*, 1972. pp. 48-49.

14. See note 8, *supra*, Summary and Conclusions, p. 8.
15. See: 45 CFR § 46.109 and *Pollard v. U.S.*, 384 F. Supp. 304 (M.D. ALA, 1974).
16. "A man may not barter away his life or his freedom, or his substantial rights." Justice Hunt in *Insurance Co. v. Morse* 87 U.S. 445, 451, (1874).
 "There is, of course, a sphere within which the individual may assert the supremacy of his own will, and rightfully dispute the authority of any human government -- especially of any free government existing under a written constitution--to interfere with the exercise of that will." Justice Harlan in *Jacobson v. Massachusetts*, 197 U.S. 11, 29 (1904).
 "The truly natural rights must be those claims, liberties, and privileges the possession of which by the person or persons in question will continue, so long at least as human nature and the laws of the physical universe remain substantially what they now are, to constitute permanent and general conditions of human happiness." W. Blake, "On Natural Rights," 36 *Ethics* 86, 94 (1925).
 "Every age and generation must be as free to act for itself as the ages and generations which preceded it. The vanity and presumption of governing beyond the grave is the most ridiculous and insolent of all tyrannies. Man has no property in man; neither has any generation any property in the generations which are to follow. " Thomas Paine, *The Rights of Man*, (1791).
17. Note 13, *supra*.
18. *Id.*, p. 58
19. *Id.*
20. Assume 1 rem per generation to result in 60 to 1500 defects and 90 recognized spontaneous abortions per million live births (BEIR, 1972, 1979).

TOTAL EFFECTS =	((No. of workers)	(No. of children each)	No. of Generations)	(effects per million)
		<u>one million births</u>				
		$\frac{(500,000)}{10^6}$	$(2)^{10}$	(1200)	=	614,400
		$\frac{(500,000)}{10^6}$	$(2)^{10}$	(30,000)	=	15,360,000
		$\frac{(500,000)}{10^6}$	$(2)^{10}$	(90)	=	46,080

21. Charter Articles 1, 13, 55, 56, 62, 68, and 76.
22. U.N. Gen. Assembly Res. 217 A (III), GAOR Resolutions (A/810), Dec. 10, 1948, at 71-77.
23. *Id.*, Art. 29(2).

24. See: T. Buergenthal and J.V. Torney, *International Human Rights and International Education*, U.S. National Commission for UNESCO, Dept. of State, Washington D.C., 1976.
25. U.N. Gen. Assembly, Res. 2200 (XXI), 21 GAOR Supp. No. 16 (A/6136), Dec. 16, 1966, at 49-52.
26. See generally: Lemkin, "Genocide is a Crime under International Law," 41 *Am. J. of Int. Law* 145 (1947), and *Report on the International Convention on the Prevention and Punishment of the Crime of Genocide*, Rep. No. 93-5, 93rd Cong., 1st sess., Mar. 6, 1973.
27. U.N. Gen. Assembly, Res. 95 (I), GAOR Resolutions, 1946.
28. Bross, I.D.J., and N. Natarajan, Genetic Damage from Ionizing Radiation, *J. Am. Med. Assoc.*, 237-22:2399, May 30, 1977, and Leukemia from Low Level Radiation--Identification of Susceptible Children, *New Eng. J. of Medicine*, 287:107, 1972.

Marrow damage linked to low dose radiation

A link between bone marrow damage and a single radiation dose equivalent to the amount most people receive annually from diagnostic x-rays and combined environmental/natural sources, has been indicated by researchers at the State University at Buffalo, New York.

Radiation biologist Dr. Joseph K. Gong says that the study represents the first evidence that single doses in the .15-77 roentgen range produce marrow damage. Two years ago, the University at Buffalo research team found that a single 1 R dosage produced similar damage in the marrow of rats. Earlier studies had implicated such damage only in the 5-25 R range.

Another significant, and unexpected, finding by the scientists is that the extent of marrow damage is similar for all doses ranging from .15 to 1.5 R. Other scientists have theorized the higher the dose, the greater the damage to the marrow.

Rats in the University at Buffalo study were irradiated, or sham irradiated, with single doses ranging from .05 to 1.5 R. Equal numbers in each group were also bled to produce an anemia to which the animals' systems would respond by producing increased numbers of red cell precursors. The rate at which the precursors were produced, as well as their numbers were the basis for the study's findings.

Dr. Gong, an associate professor of oral biology at the University at Buffalo School of Dentistry, and his colleagues found that the marrow of bled and nonbled rats, after being subjected to either sham irradiation or .05 R, reacted normally in terms of red cell precursor production. But at .15, .5, .77 and 1.5 R, the irradiated bled rats experienced a sudden jump in number of precursors, but still not at the normal rate observed in the sham or nonirradiated animals.

When irradiated animals in these four dosage levels were bled and compared to nonirradiated bled animals, the numbers of precursors in the irradiated bled group showed a lower increase than normal observed in the bled nonirradiated group. However, after study at 5, 13 and 30 weeks, the ability to produce normal numbers of precursors had still not been regained by the irradiated groups.

Although the radiation source used in the study is of the therapeutic type, twice as 'strong' as diagnostic x-ray, Dr. Gong says the latter may even be more damaging to marrow.

Further studies are underway at the University at Buffalo to determine at what point between .05 R and .15 R damage may be observed in the marrow after a single dose. Also to be studied is whether repeated .05 R dosage will produce a marrow change through cumulative action.

Dr. Gong notes that in the scientific community, one group believes radiation exposure must pass beyond a certain level to cause any marrow change while another feels any amount of exposure causes some change, no matter how imperceptible.

protein, the extent of which is related to the incident energy or power per unit area and duration of exposure. The potential for injury to tissues also depends on the "accessibility" of the tissue to the radiation, which is a function of the depth of penetration of the radiant energy.

When laser radiation impinges on tissue, the absorbed energy produces heat. Rapid and localized absorption may produce enough high temperature to boil the tissue water. The resultant steam production can dislodge cells or even produce dangerous pressure changes in an enclosed or completely filled volume such as the eye or skull.

Photochemical reactions result in activation of molecules by the capture of quanta of energy. Such capture constitutes the primary event in a photochemical reaction. Some of the photochemical reactions induced by laser exposure may be abnormal exaggerations of normal processes.

The primary hazard from laser radiation is exposure of the eye. Exposure levels, if kept below those damaging to the eye, will not harm other tissues and organs of the body. Eye damage

Microwave wavelengths vary from about 10 meters to about 1 millimeter.

can range from mild retinal burn with little or no loss of visual acuity, severe lesions with loss of central vision, and total loss of the eye from gross overexposure. Long-term exposure of the retina to wavelengths in the visible spectrum, at levels not below the burn threshold, may cause irreversible effects.

The type of damage inflicted on eye by laser beams ranges from small and inconsequential retinal burns in the periphery of the fundus to severe damage of the macula with consequent loss of visual acuity up to massive hemorrhage and extension of tissue into the vitreous, with possible loss of the entire eye.

The large skin surface makes skin tissue readily available to accidental and repeated exposures to laser radiation. The biological significance of exposure of the skin to lasers operating in the visible and IR regions is considerably less than exposure of the eye, as skin damage is usually repairable or reversible. Effects may vary from a mild erythema to blisters, and charring. Such conditions as hyperpigmentation of the skin, ulcers, and scarring and damage to underlying organs may occur from a single

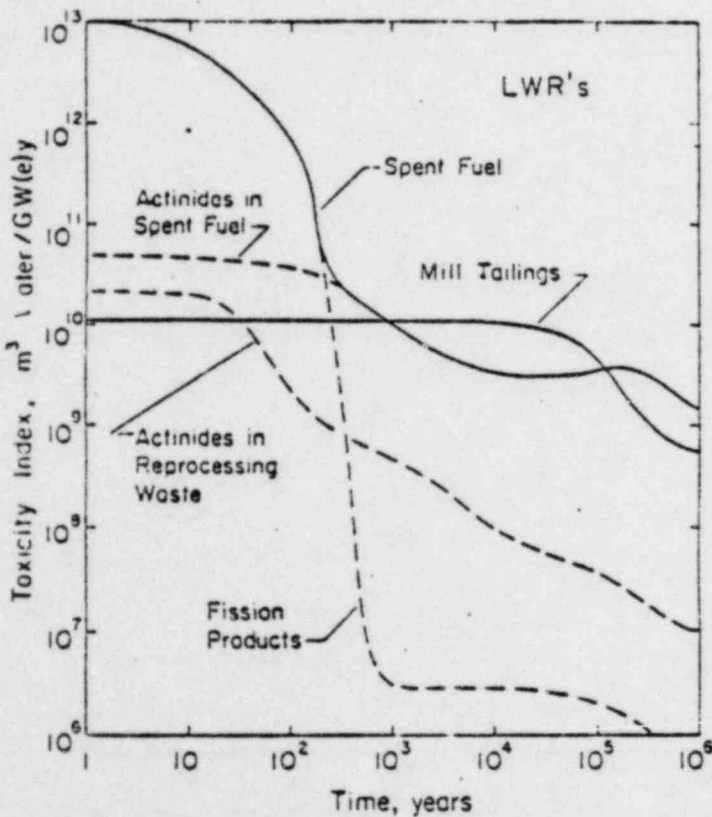
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RAD-WASTE and FREE WILL: Governments' Dilemma *

One year's fuel for a standard, 1,000 megawatt; atomic reactor starts with the excavation of 272,000 tons of uranium-laden ore and ends with the return to the earth of 35 tons of highly radioactive fission products. Some of these fission products will decay away a few seconds after removal from the reactor. Some isotopes will still be hazardous in five billion years. A single particle can cause a fatal disease. There are several hundred reactors world-wide, nearly half in the United States. Because the hazard-life of spent nuclear fuel compares with the life of our sun and the age of the Milky Way galaxy, radioactive waste from the fission process may never be spoken of as eventually becoming "harmless."

RADWASTE TOXICITY OVER TIME



Comparison of the Toxicity Index as defined in the text of uranium mill tailings, spent fuel, and of high level waste, referred to equal amounts of energy produced.

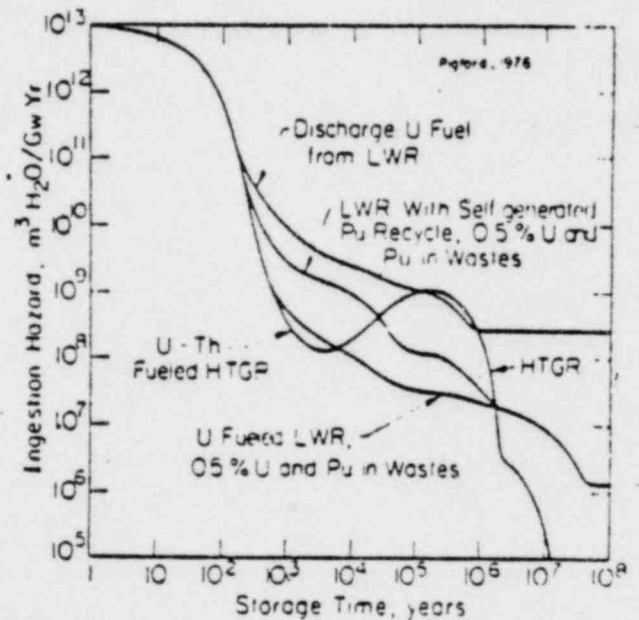


FIG. 7B2. Ingestion hazard index of high-level wastes from LWR, with and without reprocessing, and from HTGR (LWR = Light Water Reactor, HTGR = High-Temperature Gas-Cooled Reactor).

Rev Mod. Phys., Vol. 50, No. 1, Part II, January 1978

(Pohl, R. Testimony before the U.S.N.R.C. in the matter of Black Fox 1 and 2, 1978.)

*Portions of this paper appeared in the January 5, 1979 response to the U.S. Nuclear Regulatory Commission by the same author as "An Older View Regarding Unalienable Rights" in re *Petition of Jeannine Honigster*, *Comments of Petitioner's Staff on the NRC Staff Response to Her Petition*, SECY-78-560, *Docketing and Service Division, U.S.N.R.C., 1717 H Street N.W., Washington, D.C. 20555.*

The people of the United States are fortunate in that their Congress recently recognized the obligation of the present generation to hold the Earth's environment in trust for the future, and created a federal agency to enforce this duty. The unfortunate situation is that the National Energy Plan and the politics of nuclear power have forced the Environmental Protection Agency (EPA) into an unenviable position of having to defend continued use of nuclear energy even to the detriment of the environment. When the first Director of the agency resigned, he said,

"What I come to see more and more is a technology increasingly out of control in terms of the ability of human society to manage it...it seems to me we need to develop a firm commitment to the elimination of nuclear power as a source of energy on earth."

(Train, quoted in "Transnational Nuclear Opponents," November, 1978)

EPA is required to recommend radiation protection measures for use by all other federal agencies which may also be adopted as a standard for use by other nations. Because existing standards prohibit "unreasonable risk to the public health and safety," EPA has had to come up with "risk assessment criteria" including a definition for "unacceptable risk." The fourth criterion proposed on November 15, 1978, reads as follows:

Proposed Criterion No. 4:

Any risks due to radioactive waste management or disposal activities should be deemed unacceptable unless it has been justified that the further reduction in risk that could be achieved by more complete isolation is impracticable on the basis of technical and social considerations; in addition, risks associated with any given method of control should be considered unacceptable if:

- a. Risks to a future generation are greater than those acceptable to the current generation;
- b. Probable events could result in adverse consequences greater than those of a comparable nature generally accepted by society; or
- c. The probabilities of highly adverse consequences are more than a small fraction of the probabilities of high consequence events associated with productive technologies which are accepted by society.

(Criteria for Radioactive Wastes: Recommendations for Federal Radiation Guidance, Federal Register, Environmental Protection Agency, November 15, 1978, p. 53264)

In submitting the criteria to the Federal Register, Douglas Costle, present administrator of the EPA, noted that this criterion for unacceptability was the most complex of the agency proposals. He didn't say why. The Federal Register notice elaborated in saying:

Since no current waste management technology can be expected to be absolutely effective in isolating radioactive wastes from the biosphere (particularly over very long periods of time), decisions on radioactive waste management and control must assure that radioactive waste does not pose an unreasonable risk to human health and the environment...if acute exposure is projected as a likely result of waste disposal, it should affect no more than a few individuals randomly. If large groups are likely to be chronically exposed, the projected risks should be small and no greater than comparable risks that society has already willingly accepted.

(Ibid., p. 53262, 53267)

The complexity Costle noted was the dilemma of governments which have taken the path to nuclear power: since it is likely that some cancers, birth defects, and other types of human suffering will occur as a result of unavoidable releases of radiation to the environment, how much is too much?

Our comments are addressed to the moral issues, specifically in terms of human rights, which are inherent in the establishment of the Environmental Protection Agency's policies. Only when clear moral guidelines have been established can consideration be given to technological matters. We believe that human lives are of a higher order of priority than productive technology, public opinion, or financial profit. Natural rights, being inalienable, may not be weighed in a scale of social acceptability. And, further, the concept of "risks acceptable to society" can only be meaningful for those risks for which society has access to the relevant factual information and for which there exists a means for making known its views on risk-acceptability.

What are these risks which are "acceptable to society" or "acceptable to the current generation" ? According to the regulatory agencies, society by now seemingly accepts considerable environmental damage, including millions of cancers and premature deaths, as a price it must pay for the benefits of industrial civilization. Does society really accept these damages or have they been inflicted without its knowledge and without its being told of the implications to future health?

Nuclear Regulatory Commissioner Peter Bradford said recently:

"We live in a time that has as one of its greatest challenges, the articulating of a balance between scientific and technical creativity on the one hand and acceptable risk on the other. It is a theme that repeats itself in everything from aerosols to the frontiers of genetics, from food additives to space exploration to expansions of consciousness. Some of the benchmarks of unacceptable risk are clear enough in hindsight—thalidomide, the casual exposure of U.S. troops to nuclear weapons tests, urban automobile emissions—come quickly to mind. The consequences of stifled technical creativity are harder to measure (though there are many who would argue that nuclear power is fast becoming our prime example)."

(Bradford, P., "How a Regulatory View of Nuclear Waste Management is Like a Horse's Eye View of the Cart," November 15, 1978.)

At what point should technical creativity yield to moral constraints? Nearly every religion would hold that a moral line is crossed when a decision is made to take a human life. Most civilizations would have similar constraints: protection of the basic natural rights are found in Babylonian laws dating from 3260 BC, the Assyrian laws dating from 1115 BC, the Hittite laws dating from 1611 BC, the Vedic laws dating from 1500 BC, the Chinese laws dating from 604 BC (Lao-Tsu), the Greek and Roman laws, the Magna Carta (1215), the Statutum de tallagio non concedendo (1297), the Petition of Rights (1628), the Bill of Rights (1689), the Declaration of Rights (1774), the Declaration of Independence (1776), the Constitution of the United States (1787), the U.S. Bill of Rights (1789), the Declaration des Droits de l'Homme et du Citoyen (1789), the Treaty of Paris (1889), the Covenant of the League of Nations (1919), the Charter of the United Nations (1945), the Universal Declaration of Human Rights (1948), the Convention de sauvegarde des droits de l'homme et des libertes fondamentales (1950), the Covenants on Civil and Political Rights and on Economic, Social and Cultural Rights (1966), and the Helsinki Agreement (1975).

Human rights are fundamental in nature and ontological in character. They are fundamental because they are essential to a human's fulfillment as a social being. They are ontological in character because they have a religious essence—not that which transcends time and the human body, but rather that which gives a human historicity, makes each person's advent in the world historical, and views a human not as a passive instrument or impersonal product of history, but as a personal being whose active dynamism makes history.

Herbert Spencer, nineteenth-century English philosopher, wrote these comments about the basis of liberty:

"Upholders of pure despotism may fitly believe state control to be unlimited and unconditional. They who assert that men are made for governments, and not governments for men, may consistently hold that no one can remove himself beyond the pale of political organization. But they who maintain that the people are the only legitimate source of power—that legislative authority is not original, but deputed— cannot deny the right to ignore the state. . ."

(Spencer, "The Right to Ignore the State," *Layman Press*, 1973)

"The human person possesses rights because of the fact that it is a person, a whole, master of itself and of its acts, and which consequently is not merely a means to an end, but an end, an end which must be treated as such."

(Maritain, J., *The Rights of Man and Natural Law*, D. Anson, trans., 1943)

When citizens have been questioned, such as at the EPA-sponsored forum in Denver, Colorado in the spring of 1978, they clearly viewed "risk acceptability" as a moral question. For example, Mrs. Mary Hubbard commented:

"I think it's unconstitutional and inhumane to expose anyone to radiation without their knowledge and consent. I don't think most people would want to accept the risk if given the choice. I'd like to see the nuclear industry admit its errors of the past, close down, and spend all that money instead on cleaning up the mess and developing alternate safe power sources."

U.S.E.P.A., *Proceedings of a Public Forum on Environmental Protection Criteria for Radioactive Wastes*, ORP/CSD-78-2, May 1978, p. 110

A Kansas grain farmer, Ferdinand Burmeister, said,

"The intent of the founding fathers of our Federal government and our state government of Kansas was that people and private establishments have a right to obtain, maintain, and retain their property as long as this right did not interfere with the rights of other parties. . . abuse has occurred so often that society tends more and more to become unconcerned about the implications, particularly that segment of society which is not adversely affected. Nevertheless, might does not necessarily make right, the wishes of the majority are not necessarily best for any society, and the rights of the minority must be protected."

(*Ibid.*, p. 96)

Most of the opinions of private citizens that were expressed at this forum were opposed to the proliferation of nuclear technologies. Many were stated as strongly as that of Edward Ballen, who said:

"I accept no standards of acceptable risks from radioactive waste and I resent standards that are 'benevolently' determined by others."

(*Ibid.*, p. 86)

Societal activities begin to change from the category of voluntary to involuntary when people delegate authority for their welfare to a cultural mechanism other than themselves. With such delegations, the problems of society and individual free will begin to multiply.

"Involuntary" activities differ [from voluntary] in that the criteria and options are determined not by the individuals affected but by a controlling body. Such control may be in the hands of a government agency, a political entity, a leadership group, an assembly of authorities or "opinion-makers," or a combination of such bodies. Because of the complexity of large societies, only the control group is likely to be fully aware of all the criteria and options involved in their decision process. Further, the time required for feedback of the experience that results from the controlling decisions is likely to be very long. The feedback of cumulative individual experiences into societal communication channels (usually political or economic) is a slow process, as is the process of altering the planning of a control group. We have many examples of such "involuntary" activities, war being perhaps the most extreme case of the operational separation of the decision-making group from those most affected."

"In examining the historical benefit-risk relationships for "involuntary" activities, it is important to recognize the perturbing role of public psychological acceptance of risk arising from the influence of authorities or dogma. Because in this situation the decision-making is separated from the affected individual, society has generally clothed many of its controlling groups in an almost impenetrable mantle of authority and imputed wisdom."

(Starr, C., "Social Benefit vs. Technological Risk," Science 165:1232, 1969)

It is apparently time to remove the "almost impenetrable mantle of authority" from the U.S. nuclear power industry and provide the renewed opportunity for a clear moral position to emerge. The planned deaths of an "acceptable" number of future people evoke memories of Dachau and Auschwitz. Already a committee in Scottsboro, Alabama, has been formed to apply the Nuremberg Principles to nuclear power production.

As the Supreme Court wrote in 1798:

"There are acts which the federal or state legislature cannot do, without exceeding their authority. There are certain vital principles in our free republican governments, which will determine and overrule an apparent and flagrant abuse of legislative power; as to authorize manifest injustice by positive law; to take away that security for personal liberty, or private property, for the protection whereof the government was established.

"The legislature may enjoin, permit, forbid and punish; they may declare new crimes; and establish rules of conduct for all citizens in future cases; they may command what is right, and prohibit what is wrong; but they cannot change innocence into guilt; or punish innocence as a crime; or violate the right of an antecedent lawful private contract; or the right of private property. To maintain that our Federal, or State legislature possesses such powers, if they had not been expressly restrained, would, in my opinion, be a political heresy, altogether inadmissible in our free republican governments."

(Calder v. Bull, 3 U.S. (3 Dall) 386, 1 L.Ed. 648, 1798)

It is clear that there can be no involuntary societal imposition on individual free will without resulting consequences since free will is assumed to be a law of nature. All human laws derive their validity from the laws of nature, and where they be contrary they shall fail. No majority-constituted body of government, nor any authority, may rightfully take the life or happiness of any individual without that individual's consent. If the natural right to live a moral life and to be free from harm by the state is not recognized, government itself must be considered essentially a criminal intrusion.

We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the pursuit of Happiness. That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed, that whenever any form of Government becomes destructive of those ends, it is the Right of the People to alter or abolish it, and to institute new Government, laying its foundations on such principles and organizing its power in such form, as to them shall seem most likely to effect their Safety and Happiness.

(Declaration of Independence, Second Continental Congress, 1776)

There is the further problem of engaging in actions that will affect unborn individuals for whom consent is obviously impossible to obtain. The additional generation of radwastes without the anticipated ability to control seepage into the biosphere makes some loss of life and liberty inevitable and is, therefore, criminal, unconstitutional, and an unauthorized encroachment on the rights of posterity. The unborn are possessed of at least the same birthrights as the present generation. Any alternative is tyranny.

Commissioner Bradford also said,

"History, unlike science, does not allow controlled experiments. The closest we can come is to make honest use of the National Environmental Policy Act's process, for a reasoned look at the alternatives. . . I know of no other area on this front between risk and technological capability where so many are involved so strongly as in nuclear power, nuclear waste management, and the relevant energy alternatives. It is an area which, handled correctly, will tell us much about what we believe in as a society and how those beliefs can be translated into governmental and technological decisions. Handled less well, it will be a signpost on a road to a level of alienation and frustration and governmental distance from the governed that no truly democratic society can survive for very long."

(Bradford, op. cit.)

"The Constitution of the United States was made not merely for the generation that then existed but for posterity—unlimited, undefined, endless, perpetual posterity."

(Henry Clay, January 29, 1850)

In equivocating risks, making them seem inconsequential, proposals for rad-waste criteria are attempting to make present schemes of planned civilian deaths seem consistent with congressional intent and the Supreme Court's holdings that risks are to be allowed when there is a reasonable assurance of public safety. But the standard established by Congress for taking risks as a society included establishing an Environmental Protection Agency to protect and preserve the public health. The Environmental Protection Agency may require measures to obtain assurance of public health which will restrict the energy industry. It is then the duty of other Federal agencies to supply alternatives: it is not for the Environmental Protection Agency to acquiesce and remain mute. Because the public health is presently suffering from the effects of increased radiation—because so much as one person will be harmed—the industry as presently licensed is a violation of the very basic intent of Congress to protect the lives of citizens.

What our society desires is the same as the desire of our species: continued survival. In order to effect this end we must make a basic premise and adhere to it: No one's life is worth sacrificing for the sake of more energy. If anyone is expendable—if our lives would be improved by their loss of life—then we ourselves become expendable. Who among us would volunteer to be sacrificed? Whose unborn children?

All decisions by social institutions should only be made with the consciousness of implications to future peoples. Not only does this mean that future generations have inalienable rights of life and liberty and happiness, but also that no standard that allows anyone to take another's life— even in 'moderation'— can have a beneficial influence on the evolution of human rights.

These are rational, reasonable and timely objections. They are the questions that should have been addressed before the present nuclear fuel cycle was embarked upon. Is any human life insignificant or terminable by government license for ever-greater electric power production? We're saying that if we really be friends and love one another and take care of each other, there will always be enough to go around. No one has to suffer for our world to improve.

Dated January 12, 1979

Albert Bates

Albert Bates
Project Director