BIOETHICS FOR WHOM?

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The central issues in a conference on the social responsibility of scientists seem to be twofold: 1) Do we agree that scientists have a responsibility to society in their role as scientists over and above their role as responsible citizens? 2) If the answer to the first question is yes—and I cannot imagine any other answer—then how do we propose to develop guidelines for the ethical exercise of this responsibility?

It appears to me that the organizers of this conference have divided the second question into three hierarchical levels: the individual scientists; the professional and scientific societies and institutions; and finally the level of government. In this opening session on social ethics and the conduct of science, we shall deal with what amounts to the rules of the game, which are largely unwritten, but which certainly affect the decisions made by individual scientists, scientific organizations, and governments. It will be my thesis that we have entered a new era in science because science and technology, if wrongly used, now have the capacity to destroy the workability of the earth in a form that would permit the further improvement of the human condition. This capacity to destroy the earth forces the consideration of various contributing trends that already may be far advanced, and requires us to examine the possibility of trends that may extend to points of no return if "science as usual" should become the rallying cry of scientists and their professional organizations. I hasten to make clear that I am not advocating any increase in the *external* controls on academic scientists (at least), since I am strongly opposed to research contracts as a method of supporting university professors in any category. My objection is to the professional attitude that exalts so-called pure research as an end in itself no matter what discipline, category, or expense is involved and at the same time accepts no responsibility for the consequences. I maintain that members of the research community should look at the world around them and declare some scale of priorities both for the research needs of today, and for the support of graduate students and postdoctoral fellows for the future. This need for participation in the decision-making process falls on the shoulders of individual scientists and their organizations. We need a new sense of responsibility among scientists, but it should be a responsibility voluntarily chosen by scientists in dialogue with nonscientists in a culture that deliberately seeks ethical guidelines for the world we live in. What I am saying is that there exists today an "action imperative," that, if accepted, would constitute a new ethic in science, an ethic that would impinge strongly on every subsequent discussion in this conference. It is my contention that the point of debate is not whether an action imperative is required, but rather *how* can we operate under an action imperative and still maintain the traditional ethical values of science? There are those who seem to deny that it is possible to combine an action imperative with our preexisting ethical imperatives. I will argue that we have no choice if our world is to survive, and that it is in fact the existence of some pre-existing *ethical imperatives that are peculiar to science* that makes possible the incorporation of an action imperative. I refer, of course, to the scientific ethic of objectivity[8] that requires a scientist to change his mind when the facts deny his hopes or beliefs. It is the very existence of a proper respect for academic freedom and

the pursuit of truth that makes it possible to even consider a demand for an ethic that would enable a scientist to have both knowledge and opinions.

I am happy to be permitted to speak about social ethics and the conduct of that institution known as Science, with a capital S. There *is* such an institution and probably most of us here give proportionately more of our loyalty to it than we do to Church, State, or Motherhood. But has the institution of Science given us an adequate set of ethical guidelines for the times we live in? It will be my purpose to argue that it has not, but that it should and can.[12] I realize that I am here not dealing with science in terms that can be proved. I can simply assert, advocate, proclaim, reason, listen, and put myself on record. I have invented a new word and a new scholastic enterprise called *Bioethics* which I have defined in a book by that name as the combination of "biological knowledge and human values."[9] I will now assert that the elaboration of bioethical guidelines is something that is impossible to conceive as occurring without involving the institution of Science, and moreover that one of the responsibilities of Science as an institution is to develop bioethical guidelines, that is, ethical guidelines that will enable the human species to survive and prosper in harmony with the rest of the world, since we cannot survive and prosper if we continue to make war on the rest of the biosphere.

It is frequently asserted that the Church has not met its responsibilities in the further development of ethical guidelines for the present era, but it is equally true that Science has not only not met its responsibilities in this connection but has tended to deny that such responsibilities exist. Or it has been assumed, as Monod seems to have done,[8] that a single ethic of objective truth will automatically take care of all the others. It is appropriate to ask at this point where ethics come from anyway? I submit that they develop as part of each culture, and are learned by example much more than by precept. It is only when cultural changes are too rapid for viable examples to evolve that ethical practices break down, and the formulation of precepts occurs. I suggest that there are many examples of this in the past, a noteworthy case being that of Moses and the ten commandments and more recently the episode of the Iroquois prophet named Handsome Lake.[13,14] We can look at the examples either rationally or nonrationally, and I submit that if we attempt to make a rational study we come to the conclusion that ethical guidelines or precepts are developed by dialogue among people who are ethically motivated but that the incorporation of ethical guidelines into a culture occurs only when a critical mass of society is sufficiently interested to listen.

It happens that from World War I to the present there have been a number of ethically motivated scholars and scientists who have given thought to the tragic failure of the scientific enterprise to develop "a system of general ideas and values that would give meaning to human life in the mid-twentieth century."[6] Kluckhohn blamed the failure of Science in this connection on the willingness of individual scientists to avoid conflict with the organized Church as long as they were free to pursue their purely scientific objectives,[6] and, I might add, to claim academic freedom, community prestige, and financial reward.

Bentley Glass has gone to considerable effort, extending the ideas of Bronowski,[1] to deduce the existence of ethical precepts within the scientific enterprise and probably was the first to clearly enunciate them.[4,5] He could readily argue that the following four precepts are implicit in the ideal behavior of scientists, even if they had not been previously spelled out. Starting from the argument that knowledge is a social construct, that science is a collective human enterprise, Glass asserted that verification of knowledge is no procedure of the resourceless

man but an application of the collective tools of the trade and the practical logic of science to the matter at hand. From this, he and Bronowski agreed that we *ought* to act in such a way that what *is* true can be verified to be so. From this fundamental point, which seems also to be the whole essence of Monod's case, Glass developed his four "commandments" of science:

1) to cherish (sic) complete truthfulness (i.e. complete objectivity, as Monod emphasized[8]);
2) to avoid self-aggrandizement at the expense of one's fellow scientist;
3) fearlessly to defend the freedom of scientific inquiry and opinion;
4) and fully to communicate one's findings through primary publication, synthesis, and instruction.

I think we can all agree that these precepts are thoroughly incorporated in the canons of science, and it is ethically required for me to refer to Glass[4,5] in the discourse.

From this point on we come to largely unmarked territory, which it will be my purpose to explore. Glass asserted that out of the above four points emerge "the social and ethical responsibilities of scientists that in the past 20 years have begun to loom ever larger in our ken."[5] He categorized these responsibilities under three headings:

1) the proclamation of benefits;
2) the warning of risks;
3) and the discussion of quandaries.

Here we have the whole package, neatly wrapped up in three compartments, but where are these duties taught? Who decides what is beneficial? What is the risk? Who discusses the quandaries? Does this occur in scientific journals? At scientific meetings? Where is the forum that promotes the ongoing discussion of these issues? If it is a fallacy to assume that we can test what is true and what is false unaided, if knowledge is a social construct, if science is a collective human enterprise, what percentage of our scientists are following the four commandments, possibly proclaiming the benefits, but ignoring the risks and the quandaries.

Suppose we examine "the proclamation of benefits." How does this aspect move from scientific bench to the larger society? In general, two paths are followed. The journalistic path is not open to scientists by tradition in this country, although in England it appears to be respectable. Here scientists may either remain aloof or operate through professional journalists who, even when competent, are at the mercy of headline writers. What are the action imperatives for a scientist who believes his work has an urgent implication for humanity? Is it ethical for him to popularize his work, or indeed, is it ethical for him to remain aloof from the process? What is the role of the public relations departments in many of our scientific institutions? I submit that in most cases the PR men and the professional journalists are almost invariably a bad influence on individual scientists, and in general a bad influence on the science-society relationship. However, I do not put the blame on them but rather on a system of scientific ethics that gives insufficient support to the scientist who holds opinions based on work other than his own. Both Bentley Glass[4] and René DuBos[3] have emphasized the lack of critical reviews and syntheses of all phases of scientific research and its interaction with the public domain. The need for critical reviews goes far beyond the effort that is presently being made, and in fact there is a great need for parallel reviews on the same subject in the same journal, to be followed by

publication of critical comments and on-going discussion in the form of a kind of perpetual symposium. I am inclined to feel that individual scientists should not publicize their own work in the press (unless their work has been unjustly suppressed) but that the symposium in print could be the most ethical and expeditious connection between individual scientists and the professional journalists. The crying need at present in this area is for more signed critical reviews, reviews of reviews, symposia in print, and reviews of symposia. Not only should these efforts appear in various specialty journals but some of them might be encompassed in a *Journal for Mankind,* which I suggested earlier,[9] and in which the reviews would be addressed to the critical issues in the science:society interface.

But if the ethics of science are complicated in the field of communications via professional journalists, what about the role of advertising in the relationship between science and society? Is it ethical for scientific and professional societies to remain silent when TV and other media clearly set out to promote the public taste for technology in directions that are not in the public interest? Is it ethical for individual members of professional societies to assume that someone else is responsible for the societies' policies? I believe that the advertising empire has far too long been immune from criticism by organized science. Society is in great need of a nearly complete rejection of all that is presently accepted as legitimate in the advertising world, which might well be supplanted by consumer consultation services possibly operating via cable TV. As scientists we have witnessed not only the most blatant examples of questionable advertising ethics in the field of non-prescription drugs, cosmetics, detergents, and foods, but even in the case of prescription drugs, as recently noted in editorial comment in *The New England Medical Journal.*[11] Members of the pharmaceutical industry have definitely exceeded propriety by advocating that physicians prescribe tranquilizers or energizers for all sorts of common social interactions in a plain attempt to widen the area of presumed deviation from normality. What do the four commandments advise the individual scientist to do about this situation? It appears that they have permitted widespread apathy. I suggest that individuals act by urging their professional societies to publicize the issues and recommend action.

Let us examine the warning of risks and discussion of quandaries. What happens to the individual who cries wolf? Do we really think that a handful of government agents can muster the science required to make an adequate cost-benefit analysis of doubtful practices? What is the magnitude of the vested interests that minimize the extent of risks when money is involved? It is a matter of record that every scientist who has raised a cry of alarm has been castigated by some of his fellow scientists, and it is a matter that could be documented that most articles that warn of risk usually begin with some kind of disclaimer such as "Although the risks have been greatly exaggerated by some there are certain issues that are still unresolved and require further study." We can be grateful for the individual scientists who have raised alarms, including Rachel Carson, Barry Commoner, and Paul Ehrlich, and note how their efforts have been used by others to obtain larger research commitments while at the same time their words have been characterized as reckless. My point is that the efforts of these people were necessary because the pre-existing ethics of science, i.e. the "non-action imperative," had kept the rest of us silent, each concerned only with the dynamics of his own project. Science as an institution pursuing the ethic of objective truth has led individual scientists, physicians, surgeons, engineers, and technologists to believe they could practice their own specialty while ignoring the trends that eventually would doom their private worlds. Somehow we must divert some of the brain-

power and energy that has been focussed on narrow specialties and use it to develop possible solutions to the broader problems of the present world. Individual scientists through their professional societies could do much to help set the national priorities that are needed. The temptation is very great for the individual scientist to accept the economic rewards of his specialty and to assume that the performance of specialized functions entitles him to whatever reward the system can offer, without any thought of the consequences. The conduct of science must go beyond the four commandments spelled out by Glass and must demand a greater involvement in the area of scientific policy-making. The degree of involvement may vary widely from one individual to another, and from one stage of life to another, but there must be very few whose talents are so unique that they can ignore everything but their own narrow interests. In the academic world, the principle of academic tenure places a very special responsibility upon those

TABLE 1

A BIOETHICAL CREED*

1. *Belief:* I accept the need for prompt remedial action in a world beset with crises.
   Commitment: I will work with others to improve the formulation of my beliefs, to evolve additional credos, and to unite in a worldwide movement that will make possible the survival and improved development of the human species in harmony with the natural environment.
2. *Belief:* I accept the fact that the future survival and development of mankind, both culturally and biologically, is strongly conditioned by man's present activities and plans.
   Commitment: I will try to adopt a life style and to influence the life style of others so as to promote the evolution of a better world for future generations of mankind, and I will try to avoid actions that would jeopardize their future.
3. *Belief:* I accept the uniqueness of each individual and his instinctive need to contribute to the betterment of some larger unit of society in a way that is compatible with the long-range needs of society.
   Commitment: I will try to listen to the reasoned viewpoint of others whether from a minority or a majority, and I will recognize the role of emotional commitment in producing effective action.
4. *Belief:* I accept the inevitability of some human suffering that must result from the natural disorder in biological creatures and in the physical world, but I do not passively accept the suffering that results from man's inhumanity to man.
   Commitment: I will try to face my own problems with dignity and courage, I will try to assist my fellow men when they are afflicted, and I will work toward the goal of eliminating needless suffering among mankind as a whole.
5. *Belief:* I accept the finality of death as a necessary part of life. I affirm my veneration for life, my belief in the brotherhood of man, and my belief that I have an obligation to future generations of man.
   Commitment: I will try to live in a way that will benefit the lives of my fellow men now and in time to come and be remembered favorably by those who survive me.
6. *Belief:* I believe that society will collapse unless the average competence of its members for maintaining life support systems is greatly increased, and unless the capibilities of its more talented members are fully developed in terms that enrich and support the general good.
   Commitment: I will try to master a skill or a professional talent that will contribute to the survival and improvement of society and to assist others in the development of their potential talents, while at the same time I maintain my allegiance to the foregoing beliefs and commitments.

* From reference 9, with slight modification of Point 2 and addition of Point 6.

whose pre-eminence in their field has given them the privilege of tenure. This privilege should be used not just to recruit more and more graduate students to an ever-narrowing field of special interest, but should be used to create bridgeheads at the interfaces with other disciplines and to develop programs that lead today's students into the areas that will be needed by society in the future.

Recently, there was held in Washington, D.C. an international symposium on the impact of biological, genetic, and medical science on the conditions of life and the choices that individuals and society have to make. Following the symposium, which was sponsored by The Joseph P. Kennedy, Jr. Foundation, a group of some 20 concerned individuals issued a call to action that may serve to stimulate much needed involvement of scientists, in general, in the social responsibilities that are inherent in the conduct of science. They called for informed inquiry "to explore the options which growing knowledge of man's biology and of human society have made possible, and to consider the standards and the legal and social frameworks by which the choice among these options should be guided."[2] It appears that a scientific humanism[7] may emerge as the product of a new concern about the ethics of science. The humanists have been criticized in the past for their emphasis on man in the context of a supernatural God. More recently they have been criticized for their emphasis on man in the context of ecology. It is to be hoped that in the future scientific humanism can be understood in terms of biological realities, that is, we must place man and his values within the constraints required by the need for a healthy biological environment, which in turn requires a healthful physical environment.[10] This is what I mean by *Bioethics* and the Bioethical Creed that I have previously presented (TABLE 1).[9] I think that bioethical guidelines for mankind are a basic responsibility of the institution we call Science and they are especially the responsibility of individual scientists and their organizations. But for the purposes of discussion, I wish to emphasize a single addition to the scientific ethic: an action imperative that is coupled with a commitment to excellence. Is this possible or is it not?

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