

Economics, Political Science, and Law

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LASSWELL: The first of our discussants is of the discipline that the rest of the social scientists examine with mixed feelings of respect and envy, namely, economics. Prof. Jan Tinbergen.

TINBERGEN: I propose not only to give a very brief summary of my paper but to add a few remarks that are inspired by the discussions in these two and a half days. In my paper I trace how, during the last century and a half, both the aims and the means of social economic policies have changed. A number of social objectives have been added to the aims, especially care for the weak and income distribution generally, but other social objectives as well.

Around 1850 it was believed that nonintervention in the free-enterprise system was the best policy, so that there were hardly any economic policies other than those needed for so-called internal and external security. Today many problems are still solved in that way, but an increasing number of deliberate government activities and tasks are now deemed necessary, such as social security schemes, taxes on high income and wealth, regulation of total demand, regulation of unstable markets, such as in agriculture; practically the whole field of education is now being paid for by the government, a considerable portion of transportation and energy is being produced in most countries by public authorities, et cetera.

Perhaps it would be interesting to remind ourselves that pollution is not as new as it seems to be. Around 1900, laws were enacted in a number of countries to prevent certain kinds of difficulties that enterprises could cause to the environment and to make their establishment dependent on government permit. But, of course, the dimensions of the problem have grown enormously.

I should add to this list the government activities that we now recognize as necessary in most countries and on which, unfortunately, large amounts of money, as well as human lives, are being spent for ideological controversy, which is probably overestimated on both sides; I am, of course, referring to the question of war and what seems to be the basis for the present-day wars that are most in our minds.

In my opinion, war has been a threat to human welfare for a long time, but of course nuclear weapons have changed war, made it into really total war, to use that phrase of Hitler's. The tragedy is that there exists a common interest in banning war, but neither the West nor the East has found a legal shape that can be given to that common interest. The solution to the problem has not been indicated so far, unfortunately, by any of the contesting activists unless they simply want to take over Russian society. I do not think this is a very imaginative solution, so we still have to find how to give shape to that common interest.

I would like to add a few remarks on how we might deal with some of the dangers that have been pointed to so eloquently by several of our colleagues from the natural and social sciences.

The exhaustion of some of our natural resources is threatening, and pollution of air and water have already been mentioned. But, in my mind, the most important problem in the socioeconomic sphere today is the question of the developing nations. Another example is the requests for more public means, that is, more manpower, more capital, et cetera, on behalf of further research to be done.

What sort of remedies would economists generally think of? I think economists have in the last 10 or 20 years been accustomed to trying to absorb some of the lessons that the other social sciences were able to teach them. I think that many of the concepts we are using, such as welfare, have been considerably broadened and that some of the framework used by economic planners—or those who prepare economic policy, to put it in simpler terms—can be well used to integrate some of the problems under discussion. Of course, the contributions would have to come from many other people, but the framework, I think, is there. Let me cite by way of example a few of the remedies for the evils that have been discussed in the last few days. First of all, some of these problems can be solved in an automatic way by changing prices. For instance, if certain resources become more scarce and the prices automatically go up, we then restrict our demands and shift them to less-scarce goods; it may be that if food becomes very scarce we will save on that, which in some countries is still possible. If paper becomes scarce, there would be a great possibility of saving: the number of pages in the *New York Times* could be reduced to one-tenth, especially by leaving out the ads, or at least reducing their extent.

Certain minerals may become more expensive because of scarcity, and we will have to switch, perhaps, to the newer artificial products. Some commodities that have in the past been free, such as pure air and pure water, in the future will have a price, and we will have to pay for them through our taxes, or perhaps include the price for air and water as a sales tax on the price of another commodity. Of course, we will need better means of calculating prices. We do not always account for the costs of the effects of some industrial processes. If a certain production process causes pollution, then the enterprise causing that pollution should be charged for it; automatically this will increase the price of the commodity being produced.

Some, but not all, of the problems can be solved that way. I see ahead a number of new tasks for public authorities—for example, supervision of industries as they already exist, which would be necessary on a much larger scale in order to avoid pollution; or, to take another example, supervision of commercial fisheries to prevent overfishing.

Also, public tasks will arise in the field of international health and strategy. It is absolutely certain that there will be many tasks in that field; there are many studies—for example, the Report of the United Nations Development Planning Committee, which suggests an accelerated development policy that would certainly require that a number of the rich countries simply make more of an effort on behalf of the developing countries. It is not a question of favor; it is a question of cooperation and taking care of the common interests that we all have in such development.

Then, as a final example of newer government tasks, I should imagine that certain forms of waste would be handled through government measures.

To take one of my own interests, I think that certain buildings could be less luxurious; this sort of thing could be subject to government regulations.

But the important question that arises is: on what level of authority should these decisions be taken? Some can be made at the local level and others at the national level, but there remain a number that can be taken effectively only at the international, and perhaps even at some sort of world, level. I say "some sort of," because I don't know whether the East is willing to integrate with us. I, for one, hope so, but even if the Eastern representatives at the United Nations were willing there is still another, China, which is not a member, and there is a question as to whether it would want to cooperate. I imagine we would have to start in a small group, or maybe the groups that are now indicated as West and South—that is, the Western, developed countries plus the developing countries, to the extent they are willing. On what does this depend? It depends on the level you choose. I think it is essentially not a question of political choice but of technique. It depends on the nature of the effect of the measures or of the effect of the evils that we want to eliminate. For instance, take water pollution. It is almost sure that we cannot solve this problem at the national level; we must do it, perhaps, at the continental level. The recent case we set out to solve in my own country, the pollution of the Rhine's water, was clearly a case where not national authorities, but only international authorities, could make appropriate regulations to make it possible in the future to avoid such problems.

Also, if we think of such problems as radiation, it might well be a world problem for which a world authority would have to be created.

I think it is interesting that our colleagues in the East also now understand that the preparation of policies, or planning, as we usually call it, has to be done on various levels. We are debating what quantitative indicators can be found in order to determine the appropriate level. So I do think that we need international agencies, but the big question is, of course, how do we get there? And I see only, unfortunately, the not-so-very-convincing example of how we tried in Western Europe. The only possibility I see of creating an international agency is for the present so-called autonomous or independent governments to agree in a treaty that such an international agency be established and that it have certain tasks; this is the big struggle, I am afraid, that we must join; it will not be very easy to win, but it should be done; it must be done.

It follows from what I have said that the means available to any public authority will have to be redistributed, that is, to be distributed differently from the way they are done now, because no priorities have emerged for new taxes and we must, perhaps, reduce old taxes. In short, by careful calculations we have to find out what the priorities are. But, on the other hand, we may hope that perhaps some new inventions will come to our rescue in some cases where we can not yet see a solution.

A last word about ethics, which has been mentioned several times. For us, for the economists, ethics is identical to what we call welfare, and the question is to define what we believe is welfare, what the components are, what the relative weights are; this is what we want to maximize whenever we design socio-economic policy. There are no restrictions as to what elements can be included, so in that respect we can, indeed, see the framework into which everything is integrated, all desires that are brought up by other quarters, provided that we are willing to try to determine the weights. And, of course, there are differences among people. They have to be considered in deciding how the weights are

to be chosen. We have asked a question: Don't we also determine, partly by what we decide at present, the welfare of future generations? This is, of course, perfectly true, and the arguments that are brought up are absolutely convincing. This is certainly not a new problem to economists, even though it has been tackled only in the rather restricted way in which economists usually start their work.

SCHACHTER: The subject suggested for me to speak on was the organized planet, which I suppose does refer to the numerous international bodies that now concern themselves with the environment. Dr. Tinbergen has just raised the question, perhaps a little too much in terms of the new machinery, since, in fact, we have a rather complex structure of multinational organizations on both functional and regional bases that deal with many of the problems that are of concern.

The central focus of attention at this time is the Stockholm Conference to be held in 1972. That conference, which is more or less a standard response of the United Nations to problems of this kind—that is, the conference method, has become a great magnet for drawing together, attracting a number of ideas, proposals, studies, facts. It seems to me that, in the context of that conference and the conference itself, in the years of preparation—and, one hopes, the years following, a great deal of progress will be made toward determining exactly where we want to go. My own view is that many of us become beguiled by the notion of a global authority, a brand-new international body that will do all the things that are necessary to solve environmental problems.

I think this is unlikely. I think, on the whole, it probably would be counter-productive to put a major effort simply into the creation of an organization, a new organization that will have many purposes, that will have many different functions, and that will attempt to cover the whole field. On the other hand, I believe that what we do need in this field is a much greater development of a variety of international institutions, either on the basis of the present assortment of organizations in some cases, or, where necessary, the creation of new agencies. I think that in order to get the kind of participation, the kind of expertise, the kind of energy and resources that are needed to move into this field, one has to look to a lower level of authority, to use Professor Tinbergen's terms.

We need a great deal of decentralized activity, the kind of institutional activity that will attract the governments, the nongovernmental bodies, and the individuals who have most to contribute and who would be most likely to join in an effort in which their participation would be direct.

So, I would like to see a great pluralistic development in this field. I would like to see more organizations that have an ecological-regional focus, such as might be established for the Arctic region or for the Amazon or for other identifiable regional areas. I would like to see development of a great many functional-type organizations whose work perhaps is not now covered by existing agencies; the oceans themselves have interlocking organizational interests, but there are organizations that need to be filled.

I think there must be an attempt to bring this onto a more professional, or even personal, level. We need to think of ways in which scientific and professional organizations will be able to take their parts in the international constitutional scheme that is developing in this area. The kinds of functions that would be performed have been fairly well pointed out in connection with the preparations for the Stockholm Conference.

Again, in almost a typical way of international organizations, on the agenda is a grand declaration that will presumably set forth principles or, if you like, objectives that would be pursued. Alongside of that there are proposals for expansion of informational and fact-finding activities. In the current jargon, these are almost always described as monitoring activities of a particular kind, and a good deal of consideration is given not only to monitoring in the simple sense of fact finding but to the development of new techniques with built-in monitoring on industrialization projects, on development projects, on a great many of the positive activities that Dr. Tinbergen referred to.

There is also some emphasis on what might be called the political aspects of this. If the Stockholm Conference serves no other function, it will constitute, one might say, a big bang; it will create the kind of noise that it is hoped will move those governments that, up to now, have shown only a slight disposition to be concerned. But I don't think we should overstate the public-relations side or the propaganda side of this. I suppose there is a serious question whether the publicity and propaganda and the near hysteria that seem to be affecting people who discuss this subject might not have, in the end, adverse consequences. That has been pointed out by many, and I need not dwell on it.

Second, the problem is certainly beyond a problem of the mere will to take steps—that is, the obstacles are not merely those of a lack of will power. There are, as Professor Tinbergen noted, a number of serious problems, cost-benefit problems, one might say, calculations about whether it is better to put the sacrifice in one place rather than another.

One of the major difficulties faced in the discussion of this is the lack of knowledge about the links that arise; certainly people do not know about the difficulties that are now being revealed in regard to the many water resource problems, the Indus River problem, the Aswan Dam, the Rio Grande development—all of which carry with them a great many serious consequences, which may be irreversible. So that I think part of the work of the international community should be to get beyond the present level of naïveté and make it clear that this is simply a matter that requires everybody to pull up their socks and get going.

In fact, there is an enormous amount of technical and scientific work required and a much more serious set of political questions than seem to be realized. And I say my answer is, so far as the levels of authority for answering this, that there must be multiple levels of authority, they must surely take account of Professor Tinbergen's point that the actual effects and consequences of the objective factors must be considered, but I would add that they must also take account of the psychological, nationalistic, and political elements that are going to enter the picture. We will not, I think, be able to blot this out with a set of blueprints; it is going to require a good deal of negotiation and a good deal of political activity before we can move into a higher level of organization, such as Professor Tinbergen would like to see. I think we would all like to see that.

McDOUGAL: I would like to address myself to some of the remarks that have been made by earlier speakers. I was extremely impressed by the earlier discussions by our physical scientists, perhaps because I do not know anything about the subject and do not know what they are leaving out.

When I heard the physical scientists talking this morning, I could not help reflecting why I did not have any great discoveries in my paper about the interrelations of law and society or about new techniques for studying law.

As I began to reflect on why I had not turned up with great recent discoveries, my mind went back to the early 30s in this country, at which time we had a tremendous spate of effort at empirical inquiry about law. Most of these efforts came to practically nothing because the people who were undertaking them did not have adequate funds. Lawyers get success much too quickly for more active occupations, and about all I could think of was some work that was going on recently concerning juries, which is relatively inconsequential in the larger picture, or some of the studies that Professor Lasswell has made about factors that affect decisions, or some of the material that Professor Dror presents in his memorandum.

But I began to reflect that maybe there were more profound reasons why I did not have this kind of material. I think it is because of our contemporary conception that law is not something autonomous; you have an inherited body of rules that inhibits behavior, but it is a process by which the members of the community clarify and implement their common interests. All law is policy, though not all policy is law. I thought briefly on the function of the lawyer—and of the legal scholar who tries to assist in this function—which is to take the knowledge that you people produce and try to employ it in this process by which common interests are clarified and implemented.

We need precisely the same techniques for policy clarification that you need. We need the same skills, the same techniques for historical study, for study of past decisions, to draw on past experience, that the sophisticated historian employs or the cultural anthropologist has developed in recent years. We need the same understanding of conditions, the same scientific skills that all of you who work with the human personality require, that all of you who work with the factors that affect social change require. We need the same skills, the same techniques for projection into the future, and when we come to the creation of new alternatives in principles and institutions, such as Professor Tinbergen and Dr. Schachter were talking about, there is a tremendous equivalence of institutions and principles that might serve the same policy goals, the same value consequences; any lawyer who thinks that there is only one way to do something immediately convicts himself in the eyes of the profession of being an ignoramus. What is required is the fitting of new legal techniques to very specific contexts. This brings me to my lack of appreciation of what happened this morning, my very great sense of unease.

The way the problem was left, in fact, the way our problems have been left through most of this conference is—well, let me recall Mr. Maddux's invitation to the social scientists to come to Washington and be wined and dined and be given great grants by the World Bank to go out and solve a lot of their problems. He began with one problem with which this conference is concerned, but which relates, perhaps not most directly, to the environment, though I will proceed to relate it. Mr. Maddux wanted to know what aggression is, what you people know about aggression, and he talked as if he knew what the word "aggression" referred to. I would like to suggest that before he employs social scientists, he needs to employ a good lawyer to delimit his problem for him. This happens to be an area in which I have specialized. There is a complementary concept to this concept of aggression that he was throwing around so loosely, and that is the concept of self-defense. If you relate these two high-level abstractions to empirical reality, you will see that they refer to a whole process of interaction between territorial communities.

The policy that Mr. Maddux was calling attention to was that embodied in Article 24 of the United Nations Charter, and since I used it in my paper, I have it here, and I quote: "All members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state or in any other manner inconsistent with the purpose of the United Nations." If I had Article 51 with me, I would bring forward this concept of self-defense, of self-help; every civilized community has both these concepts. It is indispensable to law in any community that unauthorized coercion, violence, force, be restrained to the utmost. What we mean by law, in one simple sense, is a decision taken in accordance with community expectations, not arbitrary, episodic changes that go on. On the other hand, not even our most mature societies have been able to dispense with the concept of self-defense.

Suppose you have an interaction across national boundary lines, what Professor Jessup has called a transnational event. Let us take one that specifically relates to environmental problems: Suppose some state acquires the technological control over weather resources in such a way that, by manipulating the air currents, the atmosphere, the clouds, the water above its land masses, it can impose severe destructive effects on a neighboring state; it can make its fertile bottoms become deserts, its fields dry up, its people go hungry and thirsty.

Mr. Maddux wants to know what aggression is. The lawyer who has to advise, the lawyer who has to decide this has to be able to decide whether state aid is imposing deprivations on its neighbors. He has to decide whether this is unlawful or is lawful, is self-help or is self-defense.

Let me indicate to you what is required. If you just make minimal sense out of this question, you have to know who is acting with respect to whom, what are the territorial communities, how big are they, what is their relative strength, what are their demands in relation to each other? Is this being done for purposes of conservation, of trying to save something in the original state, to get rid of a desert or make a valley bloom, or is it being done for deliberate destruction? Is it being done as part of a concerted scheme to extend rule over a large area?

There are a great many factors relating to the demands of the parties, their expectations, their identification, who they think they are, and for whom they are acting. There are other features of the context that you will want to know: Who else is affected in this, and to what degree? What is the geographical area affected? What are the time dimensions? You have to go into these questions in great detail. What are the relative bases of power to the parties? What are their relative resources, their control over people, their institutional efficiency? What instruments of destruction accompany their manipulation of the weather? Has there been a great fanfare of the diplomatic instruments, the ideological instruments? What is the verbal accompaniment? Is the military instrument being readied? Are there troops at the boundary? Do they threaten to move or close off other resources? What, in detail, is the degree of destruction achieved or threatened? Are there realistic expectations one party will have to resort to the military instrument for its self-defense?

Now, this is just the beginning of this kind of inquiry. Before you can go much further, you need to clarify in minute detail the policies that are embodied in this policy, which I said was of minimum order in any civilized community. When you say "minimize coercion," that is, lessen it, it is a very

ambiguous concept. Does it include the long-term prevention of the conditions that lead to this kind of destruction? Does it include the immediate deterrent of destruction that is threatened in the here and now? Does it include the restoration of order, the stopping of destruction once it breaks out? Does it include the rehabilitation of the parties, the short-term binding up of wounds, the long-term reconstruction, the effort to create the conditions so that the conflict will not happen again? The specific measures that the general community may invoke in the kind of context I have described will vary with every one of these subobjectives. So what I am trying to say to Mr. Maddux is that, before he can invoke the use of social scientists, he needs to have his questions sharpened, in quite minute detail, relating to the entire context of a whole string of objectives, objectives I have only begun to indicate.

I related this problem to the environment; this is one of the problems that we face when we talk about securing a global environment. I would like to generalize what I have said to everything that we have been talking about. In the opening pages of my paper, I tried, in a few very broad strokes, to formulate our problem in terms comparable to those I have just been using about aggression and self-defense. This kind of formulation is what I have missed most in this conference so far. As lawyers trying to delimit the problem so that goals can be clarified, so that we can draw on past experience and suggest alternatives to secure the common interests, we need to be able to clarify these environmental problems, population problems, genetic problems, in much greater detail than we have yet done. The first thing we need to know about the environment is what the detailed damages, the injuries to the environment are. To what degree are these injuries an indispensable component of the processes of production?

To what degree are they not?

What are the alternative ways of producing the differential potentialities for damage and injury that are involved? What are the factors that affect all the injuries that we can describe? What are some of our basic goals about prevention, deterrents, rehabilitation, reconstruction, et cetera, in minute detail? What are the technical solutions that the engineers, the community planners, the people who are geared for those problems would recommend for the solution of these problems?

It is obvious that the solutions are all interdependent.

We know enough to know that the basic factors underlying all this environmental injury are the violation of the interdependencies of man's practices in the enjoyment of his resources, the nature of the resources, man's nature itself. We need to examine these interdependencies in much more detail than we have. As one who began his life as a community planner, I do not believe that the technical solutions are beyond us, that the imagination of man is not enough to cope with this. But before we can bring our recommendations to bear in anything like rationality, we need to have the problems formulated much better than they have been. Here is where we need the knowledge and skill of all you social scientists. The question posed here to the legal specialists was: What are the potentialities of our authoritative processes of decision for clarification and implementing common interest for dealing with these problems?

I would like to introduce a slightly different note from that which was introduced earlier in some of our other discussions. I have colleagues who run around the country declaiming that we are in a quick race for survival, that in five years or ten years if we don't do this or that or the other, we

will all be swimming in oceans of poisons, and that the law is all against us, the law is outmoded, that we have to scrap it all and begin anew. I don't happen to feel that way at all. I think we have tremendous legal assets for coping with this problem and for making use of the knowledge and skills you people possess. I have organized the legal bases under three different headings. The first relates to our general understanding of law, of legal processes, our skill in manipulating these processes of authoritative decisions or theories, and other procedures.

The second relates to our inherited world or global constitutive process. The thesis is that we have, on a global scale, a basic constitutional law process or structure that is functioning reasonably well.

Third, our final asset is the inherited public order, our inherited prescriptions, policies, practices about environmental problems.

In terms of our theory about and conception of law, we have moved, after many centuries, toward a sociological conception that will make use of all the findings and procedures of modern science. When we reject the message of natural law approaches that have dominated the thinking of mankind for some five or more centuries, when we reject the fatalism of the historic approaches, there are today very few adherents to the European or English notions of historical jurisprudence.

We reject the alleged autonomy of the analytical or positivistic approach that regards law as something unique and different; I am now talking of the working assumptions of practicing lawyers; I am not talking of the debates you get in the academies. We still have philosophical debates in the academies about the relative merits of all these different approaches, but they are relatively inconsequential. The operating lawyer today works with intensely sociological presuppositions that permit him to make use of all of *your* knowledge and skills. If I had time I would spell this out in terms of the observational standpoint, the focus of attention, the different intellectual tasks that are regarded as relevant, the need for commitment, for explicit postulations of values.

Let me say only a few words about the focus of attention and relevant intellectual skills. In terms of the focus of attention, it is squarely on decision, not simply rules, but rules and operations of what the choices are that are sustained by effective power, by severe deprivations or high indulgences, not simply decisions, but authoritative decisions, decisions that are taken from the perspective of authority. The perspective of authority we work with has been cited several times in this conference. The perceptions are as old as the pre-Socratic briefs, and the expectations are those of the members of the community about the decision process of the community, what they want decided by their community, how they want it structured. It is not something esoteric or mysterious to be derived from the laws of nature. It is not simply authoritative decision, but processes of decision. We are interested in the whole continuous flow of sustained choices.

In this process of decision we make a distinction between two different kinds of decisions, the constituted decisions and the public-order decisions. The former decisions, those that establish this process, say who the authoritative decision makers are, what the basic policies are, what the established structures of authority will be, what the authorized procedures and the different kinds of decisions are that must be made.

By public-order decisions we mean the whole flow of decisions that come

out of this constitutive process to regulate other values, the wealth process, human rights and civil liberties, education, enlightenment, the whole spectrum of value processes. Beyond a process of decision, the contrary decision demands explicit relation to social process. Every community has a comprehensive social process exhibiting interdependencies, interdetermination like our noble community. Apart from this is an effective procedure process. This constitutive process is maintained and operated by the people who hold effective power in the community. Authoritative decisions are a response to events in this process and in turn have consequences for this process. All of this has to be taken into account. Beyond social process the contemporary theory talks in terms of community process. We all live in a hierarchy of communities from the local to the global. Since the problems are global, the response has to be global in terms of hierarchy of communities.

If I turn from my contemporary theory, which I think is entirely adequate, to this inherited constitutive process, in much of the literature I see it begins with complaints that these problems are global but the process of decision is not global. I submit to you that if you look, as an anthropologist would look, the process of decision *is* global. It is becoming tremendously democratized. In recent years we have not only the nation-states but the international governmental organizations, political parties, pressure groups, private associations without number, and the individual human being playing a role. If we look at the policy by which this process is maintained, we have had a clarification on this basic policy of minimum order that I mentioned earlier. Article 24 of the U. N. Charter was a tremendous advance toward the notion of repressing unauthorized coercion. The Declaration of Human Rights covers a dozen other declarations, and we can use a movement toward the clarification of basic demands.

We have had a tremendous proliferation of new structures of authority with international organization. We have had tremendous new power conferred upon this central structure of authority. The terms that Professor Tinbergen used, this dichotomy between international concern and domestic jurisdiction, has almost disappeared. The world is in it in terms he suggested, in terms of the relative impact of activities; everything today is global in its impact. There is increasing inclusive control over the bases of effective power. There is tremendous improvement in intelligence function, and by this we mean a good deal more than the monitoring that Dr. Schachter was talking about. The procedures for application are tremendously improved with a movement toward compulsory application in the bank procedures, in the new draft convention on treaties.

Shifting now to the public-order inheritance, I deal first with the allocation of resources, the important point being that most of the important resources of the world other than the land masses have always been allocated under inclusive controls; the general community makes and prescribes law for the oceans, the air space over the oceans, outer space, the international rivers. There is a tremendous range of resources already in inclusive control.

The exclusive appropriation is honored only by genuine occupation and productive use, but to turn to the prevention of injurious relations of cross-boundaries, we have not only these major deprivations that we have talked about, but we have a pretty good law of torts when one state wants to use its resources to the injury of another. I could run through a tremendous number of these inherited prescriptions that facilitate a rational enjoyment of the

environment, but I think I will conclude and say that when it comes to the recommendation of alternatives for improvement, I would follow the lines that Dr. Schachter and Professor Tinbergen followed, but I would suggest a much more comprehensive approach, to look systematically at the whole global constitutive process and make an effort to improve every feature of it. This relates not only to the environmental genetic problems but to other things as well, to mobilize pressure groups and political parties; perhaps we will have an opportunity to talk in terms of these alternatives later.

JESSUP: Unhappily, I have not been able to attend previous sessions, and therefore I am not in a position, as Professor McDougal was, to comment on remarks made at earlier sessions, and I must confine myself, therefore, to what has been said this afternoon. Since exaggeration can be the soul of brevity, I shall exaggerate one institutional element that, it seems to me, has been passed over by all speakers. I refer to the element of adjudication.

Mr. McDougal—and I think I quote him exactly—said the lawyer has to decide. As a person who has been a judge, I say the lawyer does not have to decide, he merely has to try to persuade the judge how the judge should decide. Unfortunately, in the context in which Mr. McDougal was talking, which was the context of the problem of the distinction between aggression and self-defense, it is left in our present international system to the lawyer to decide in the zones of making a recommendation to those people whom Professor McDougal calls the decision makers, and these are the politicians, these are the government people; they are not the judges; they are the people swayed by self-interest, and, unhappily, the lawyer frequently tells them what may be the course that they can follow without getting into too much trouble, regardless of the social consequences for them or their neighbors or for the total environment.

In the previous comment, if I may start first with what Dr. Schachter said, about the 1972 conference in Stockholm, he spoke of the way in which these conferences usually begin. You have a noble declaration, and you have what he called the monitoring procedures, and then you have the political promotional procedures, and this is all very well. Then you must pass, I suppose, if you want to get results, to what Dr. Tinbergen spoke of—treaties. You have to get an agreement among the states in which they will agree to be bound by certain rules or principles a little more specific than those general doctrines to which, in part, Professor McDougal was referring. But it does not end the problem when you have agreed on a treaty. Every treaty, every agreement in the history of man, has had to be interpreted, and you must have some authoritative body to make the interpretations. In every modern society the interpretative body is some kind of court or tribunal.

In terms of problems with the environment, et cetera, let me indicate—and there has been some passing reference to this by Mr. McDougal of the situations that point up the role of and the necessity for the role of the courts—you have the recent declarations of Canada insisting that it must take such measures as it sees fit to preserve its Arctic territories from threatened pollution. The United States has questioned whether Canada is not stretching its powers too far, and proposed to the Canadian government that the question be submitted to the International Court of Justice at The Hague, and Canada refused.

In an earlier case, some years ago, a smelter on the Canadian side of the border was pouring sulfurous fumes across the Canadian frontier into the United States, with resulting damage to forests and to human beings. In that

case, Canada and the United States agreed to submit to an international tribunal the question of liability, the question of damage, the question of mutual control. That particular bit of pollution of the atmosphere was taken care of, eventually, through the authoritative decision of a tribunal that had to be set up by the agreement of both parties.

Dr. Tinbergen referred to the problem of overfishing. This has been regulated over and over again by treaties, sometimes with considerable success, as in the North Sea, in the North Atlantic, and to a certain extent in the North Pacific. The amount of success under the various agreements varies; perhaps the most successful agreement, which also followed an international adjudication, was the arrangement that is now participated in by the Soviet Union, Japan, Canada, and the United States for the protection of the fur seals in the North Pacific and the Bering Sea; a procedure has been worked out for the conservation of that particular resource.

I have taken the liberty in my paper to quote from one of our colleagues. Perhaps I have misapplied it, but I have referred to this expression: "The fossil ape encrusted in our hearts." I would suggest that in this process of international adjudication, the question of what is in the hearts or minds, what are the motivations of the governments concerned, is of the utmost importance. Dr. Tinbergen may recall the little dispute of his country with neighboring Belgium over a small parcel of frontier land. It was a very curious situation: the boundary was uncertain; it ran right through the middle of the billiard table in the town, and one could gamble on one side and not gamble on the other, because the laws of the two countries were different on that form of amusement. The question was submitted to the International Court of Justice, and the court decided it. The lawyers were very gay. It was a cheerful split, and it was settled happily. And recently there have been reports on how successfully the details have been worked out.

There was similar good will in one of the most recent cases before the International Court of Justice, a fight between the Federal Republic of Germany, Denmark, and The Netherlands, with regard to the areas of the sea beds or the continental shelf in the North Sea pertaining to each of the three states, so that each one would know what part of the areas could be exploited by each state. Although the judgment of the court has been criticized, that is what lawyers are for, and that is to criticize the decision of courts, particularly if the lawyers represent the losing party. The recommendations of the court in that case, although not final, have led to what I understand is a reasonably satisfactory arrangement among the three governments, which have followed the procedures indicated by the court.

On the other hand, there are cases that have come before the International Court of Justice in which there has been the most strenuous underlying conflict, disagreement, violence of feelings, which have certainly been characteristic of the episodes in question and may have been reflected in the outcome of the case in at least one situation. I refer particularly to the dispute between Ethiopia and Liberia on the one hand, and South Africa on the other, in reference to the disposition of what was the mandated territory of Southwest Africa. There are other situations of that kind. I don't think it is necessary to have an elaborate vocabulary or elaborate theory or elaborate philosophy simply to say that if there is a situation that at least a certain number of governments are willing to have settled peacefully and definitively, this can very well be done with the existing machinery.

It would be very helpful to have certain basic agreements concluded, for example, at the Stockholm conference in 1972, but until we have something a little more than what Mr. McDougal talks about in the matter of legal skills, until we have a little more than the kind of organizational arrangement that Dr. Schachter spoke of, until we have a little more of what Dr. Tinbergen was referring to as the economic pressures forcing governments to find a solution to the dangers of environmental pollution and similar other difficulties, until we have more of this kind of pressure resulting in the change in governmental attitudes, the final utilization of this last resort for international adjudication will not be with us.

DROR: I think it is impossible not to sense a certain dichotomy between the contribution of the physical sciences and some of the social sciences on one hand and the contributions of this afternoon. I think this is not an accident but will reflect quite significant differences of approach.

Let me start with the apparent movement of physical sciences and parts of social sciences, not including economics, which is a chapter by itself, into prescriptive recommendations. In the discussion of birth control, in the discussion of pollution, in the discussion of conflict resolution, and in many other of the fashionable discussions, we have a jump by many hard scientists—to use an incorrect but widespread slogan—into prescriptive recommendations, and I can but share the feeling expressed by Professor McDougal that most of these recommendations are presented in a way that we would not expect a good lawyer to adopt, but in the way of a bad lawyer, who has never heard a Brandeis brief or any other devices for bringing knowledge and recommendations together.

To be only slightly overextreme, I find in many of the prescriptions offered by physical scientists, life scientists, sociologists, and some others, for the ills of society, an undistinguished mix reminding me of a ruined salad, between value assumptions, risk, time priorities, agreed facts, doubtful facts, and many other components, all of which are presented in an unclear mix, usually unclear to the person making the recommendations, and usually presented behind the umbrella of "I am an embryologist; therefore take my opinion on pollution seriously; take my opinion on birth control seriously." This is very difficult to accept. I think that one of the missing links, or one of the missing underlying necessary elements, is, to use somewhat overphraseological language, a prescriptive silence, or an elaborated methodology, or at least a worked-out analytical framework for presenting recommendations. And, indeed, as Professor Tinbergen explained, the major advantage of economics is that the present part of such a framework—not a sufficient one, not a complete one, but the economizing idea of optimizing uses of resources—has been up to now one of the best frameworks that we have had for putting scientific knowledge together with values into explained and explicated recommendations and prescriptions we can understand.

The same is true for a very good lawyer's briefs, though somehow I am not so sure that they are as widespread as Professor McDougal represents. I agree this is what we want, but whether this is the norm of lawyers is quite another question, which we will defer until there is evidence brought forth by others. In other words, I think that we have here a clear need for a systematic approach to the question of how to improve decision making or policy making, or whatever you want to call it. The would involve not only the question of framework for analyzing problems, something

dealt with significantly in economics, but, even more important, the institutional aspects; what types of institutions do we need for better decision making? What types of persons do we need? What types of culture do we need?

Let us remember, for instance, that one of the problems in many countries—often called underdeveloped, but we will leave that term aside—is the question of “rationality content of culture.” Without trying to define it, we can deal with it at least with conceptual tools. Now, this is beyond what we have. In fact, let me just take the illustration of pollution. Here I would suggest that, more important than the question of what good technological solutions we have to prevent pollution, is the question of what we can do in order, on a current level, to improve our handling of pollution issues. In other words, the main question should not be what to do about pollution in Los Angeles but how to increase the capacity of the Los Angeles decision-making community to decide pollution issues as they arise, as technology changes, as criteria change, and as aspiration levels change.

I jump here—and this is the only esoteric term I am going to use—from the decision level to the *meta*-decision level, or from the policy level to the meta-policy level. Meta-linguistics is a policy for discussing language; meta-policy is a policy on how to make policy. We need a step beyond available normal science, we need an additional approach, which was first proposed by Professors Lasswell and McDougal. Let me use, just for the sake of brevity, the term *policy sciences*, but don't mind the name. We would be better to call it policy studies, policy religions. To illustrate possible changes that may be necessary in the basic paradigms of knowledge, I will enumerate such new paradigms. One main concern with meta-policy was to go beyond the question of how to solve disputes; problem two, to present foreseen crises, and three, the question of how to improve our problem-solving capacity for the future. This is really a basic point.

Let me return to pollution. There has been very little discussion here today about how to change the politics of pollution and how to change the politics of pollution control. All the nice technical shortcuts have zero visibility and are, perhaps, very counterproductive.

Pure knowledge, after all, is often the most practical thing in the long run. The distinction between pure and applied research should not be mixed up with the distinction between pragmatic and highly basic knowledge. While one will agree with Professor Price on the need to encourage basic theoretic research, the question of what problems to direct our research at, what areas to select for pure abstract research, is quite a different one. To be brief, I think we can just as well opt for abstract-research issues that in the long run are relevant to human affairs.

The next illustration that I think is very important is the question of using the tacit knowledge of policy makers. Indeed, when we speak about waste of resources, one of the most amazing wastes of resources is that of, let us say, politics or policy practice. One learns a trade only through a very expensive apprenticeship. I do not mean the cost for the person himself, but for the side effects from his activities. Very little has been done to try to get people with experience to distill their experience, to pass it on to others. In other words, looking for research methodologists to distill the tacit knowledge of people with experience in policy issues, so we can try and build up some accumulations, is quite an innovation in research methodology.

The question of a time perspective, past, in the future: I was quite struck

by what I heard today and yesterday about how all or most of the contributions focused on our present problems: pollution control, birth control.

What about the problems that are around the corner? For instance, we have a promised invention, and soon we will have the chemical ability to influence the sex of the unborn child. Just think about the effects. This is one invention that will require government interference with intimate family decisions on a level that has not been practiced in any totalitarian society in history. Either we give up the balance of sex, which means a complete change of social structure, or we establish quotas. In some countries genetic ideas will be considered. In any case, we are sure to have much harder problems around, and one of the things we should do is to think in advance about them, rather than run behind popular-appeal problems, although they are also important.

In any case, think of the present as a bridge between the past and the future. Tying in future studies with historic understanding is a far cry from the approach of most physical scientists and, I am sorry to say, most social scientists. Lawyers are often, in this respect, much better.

The last point I am going to mention is explicit recognition of the importance of extrarational and perhaps irrational natural aspects of policy making. The question is, can we do something to increase creativity without understanding it? We can use black-box techniques. Some of the studies of research laboratories or, let us say, the question of the use of drugs to influence creativity for better policy making is certainly an important area for long-range study and research.

Let me say just a few words on possible implications. What we are dealing with is a question of a new symbiosis between power, on the one hand, and what is called the scientific approach, on the other. Instead of the pure scientific approach, I would prefer to say the uses of systematic knowledge, structured rationality, and organized creativity as contributions to policy making. Certainly this requires many more changes than I could easily achieve here.

As this is not a meeting of politicians, let me mention changes in the scientific community. The implications for scientists are very rigid. Easy implications entail new types of research organizations. Let us say "think tanks" as a main invention, to bring together science and policy making. Questions of new training and teaching programs as first proposed many years ago by Professors Lasswell and McDougal with respect to policy teaching at law schools are only now being tried in some respects in the United States. We know that we in the university are very conservative. More important than such marginal changes are the questions of our own self-restraint and humility and recognition of self-limits: one cannot be an embryologist or a political scientist and get up and say, "I support measure A, B, or C for birth control, therefore the government should do it," and sit down. The limitations of recommendations, the limited knowledge in one or two disciplines, have to be recognized from the moral point of view; although we might try to influence citizens as a professional élite, the legitimate judgment belongs to the politicians we regard as legitimate, and efforts to usurp it and smuggle in the decision and say that the Catholic Church in Country A should do so and so, and the government in Country B should do so and so—on what moral basis do we presume to tell them what to do?

We can say, as citizens of the world, unless you do so and so, I think the

world will be ruined. And if you believe in a religion, you prefer the world to be ruined rather than change your mind—at least the moral dimensions are recognized, and the technical and professional implications. Being an expert in embryology does not make one into a platonic type of universal policy solver. It is a much harder job than that, and we are starting only now to solve the problems. But in many respects we have to know how to look for methods, how to treat the more complex problems.

CATLIN: First, I would like to congratulate Professor Dror on the extreme clarity of what he has to say. It serves as clarification of much of our discussions.

The subject of environment is not a new one. It goes back to Aristotle, who wrote on the air and the water. I think that perhaps we, especially, tend to such speculation today because of the reaction of the astronauts; they started their way back to the blue and beautiful world, and we had, to some extent, reversed seeing it. Instead of discovering other worlds—and we are merely a small part of them—we are becoming again earth-centered and concerned with saving this earth. All of us, I presume, will be sympathetic with this. I have a feeling that when President Nixon and Mr. Harold Wilson are in agreement, the next theme of the 70s will be environment.

It is a method of distracting attention from the problems of poverty and war and race, which are highly controversial and somewhat inconvenient to put in the foreground. There is a risk that we are being offered a placebo. There is a risk we may go in for boondoggling, that the humble people who used to be called geographers will descend from those attic levels and come down on the ground floor as ecologists, doubling their income and becoming the prophets of the 70s. Against that, I am frank to say I want to issue a cautionary warning.

I do not want to speak today except with brevity. However, I would look back to the Rome conference, four years ago. You remember in those days the World Academy had three working projects: One was desalinization—of obvious value—leading to, perhaps, fertilization of the Sahara. It is not my purpose to discuss that. I merely throw it out as a positive suggestion.

Another project was the World University, which I will not discuss here except in passing, and the third problem was that of conflict, of peace and war. That I do want to comment on. I repeat that we, all of us, are against matricide, and we, all of us, are in favor of the good earth. When we tackle these environmental aims that are so popular and so applauded, the only thing that emerges is the issue of planning. As soon as we start this planning, we will come up against controversy. Many people will find the pace of this planning inappropriate. I prophesy that within five years the pollution program will be steeped in bitter controversy—spokesmen for industry, air, automobiles, chemicals, et cetera, will say, "Why are you trying to settle these things for us? This is contrary to free enterprise."

In our meetings I have heard several people say that the final objective is the increase of free will. I doubt it. On the contrary, I think that our planning tends quite rationally to decrease the area of freedom. If we choose the phrase "increase of rational free will," I would subscribe, because the test word will be "rational."

In discussions around the biological sciences here it has been said that we are going to have to make decisions that will affect future generations, whether they like it or not. They will not be left with a free will. Our decision is to

risk ourselves on how we are going to shape the future. Sometimes free choice is merely another name for egotism.

There is a basic conflict between technocracy and human values. If capital-punishment judgment were submitted to most people, I suspect most people would be in favor of capital punishment. One of our speakers yesterday suggested that the machine was obviously going to open powers for man and that technocracy will do the same. He has forgotten that machine and technocratic developments have their own momentum; the automobile lays down certain rules that must be followed if we are going to get efficient transportation; it does not depend on what you look to as a pretty paradise, it depends on the mechanical or technological aspects of the automobile. The computer is obviously advantageous, and most human beings should be like lead slugs that will be fitted conveniently into a slot without too much originality and without causing too much disturbance. I think that we ought to ponder this basic trouble.

One of our greatest leaders of youth, Henry Marcuse, age 71, seems to have got into a muddle, not being sure whether he is praising technocracy or damaging the system that, in large part, is shaped by technocratic convention. The particular themes today are economics, political science, and law. We have had a very able and outstanding exposition on the matter of law. To revert to the matter of purchases, a Marxist would say they revert to the matter of economics, but after all, the Soviet Union is the outstanding example of policy determining economics rather than economics determining policy.

I recall, considering political science, a statement by the late Lord Attlee about scientists. When I repeated it to Robert Oppenheimer, he was not pleased. Lord Attlee said: "I have always found that the physical scientist's judgment in political affairs is much worse than that of the ordinary man in the street." This sounds like a paradox, but I don't think it is. I think, like Professor Dror, that if a man is an embryologist and says, "I am a super-expert in embryology, and now I am going to tell you something in a field remote from embryology," we should have a certain humility, but, on the other hand, there are people like Keynes; there are people who are relevant and tremendously effective in the currents of political affairs. If we get a Keynes or a political scientist in the same position, that is magnificent, although Keynes was not devoid of vanity. I think that the crux in this field of short-range and long-range decisions is to have democratic confidence in the people's making short-range decisions within their own experience; but I also agree that the experts need humility.

I was interested in what was said earlier—that there are certain things that have got to be done, and done quickly. But what struck me was the *number* of things that are urgent, and in all cases have to be done—we do not want pollution, we do not want war, we do not want poverty. In other words, we can, with humility, attend to shaping positively the future, so let us address ourselves to negotiating those things that have to be cured. After all, protoman goes back four million years, and I suppose that with any kind of luck we too could last some millions of years. Therefore, there is a lot of time for us to reform, perhaps hundreds or thousands of years, but the real danger is that we will poison the earth, or that we will blow ourselves up in a global war.

These are the things that demand immediate, urgent attention. We must choose the essential things, the priorities; and God bless clearing up the litter.

In my order of priorities: poverty, certainly; pollution, certainly; overpopulation, certainly. It is not easy to generalize about these problems, but above all in importance is war.

Hence, I come back to what was four years ago one of the specific objectives of this Academy. I have a great interest in saying what to my mind takes a high priority in the essential question of selling what are going to be our priorities. We abolished slavery long ago, but how in heaven's name do we abolish war? As a member of the Pugwash group, I am not terribly confident—except in terms of little black boxes. I am frank to say that my own conclusions tend to be simple; if we can solve the problem in terms of regions, then maybe we can solve it in global terms within, at least, the life of our children.

Let us address ourselves to regionalism. If we can create a world code, I am sure we would all be in favor of it, and in favor even of what has been hopefully described as a big bang in democracy; we have to have big bangs in order to impress the politicians, so let us organize a big bang, but don't let us overestimate what a big bang can do. I say that ideological perils are an error. I do not attach great importance to ideological differences. I think that in time people may recite the same words, but they do not mean the same thing. As was said this afternoon, the issues tend to be those of power rather than those of variety of ideologies.

The final question I want to raise is, How are we to go about this? We do require, if Professor McDougal will permit me, interdisciplinary studies. I am not going to overestimate them, but I think that the anthropologists, psychologists, and others have contributions to make. (As a political scientist, I would allow the lawyers in on only the very central discussions, because there tend to be problems of sovereignty, and, when all is said and done, problems of sovereignty are problems of interdependence).

Aggressiveness, yes. I submit we should attend to and study aggressiveness as well as self-protection.

I am not asking that the same amount be spent on this kind of research that is spent on defense—that is nonsense. I am in favor of the astronauts and I am not in favor of cutting off all money for the astronauts and devoting it to the study of peace. But I *am* saying that a certain proportion of the money being spent on the astronaut ventures could properly be spent in a study of peace and war. Although I feel that I am against all pollution, the major pollution is perhaps that of global war, and in touching on global war, I hope that we go to the professional bodies, the global people who have only allocated economics, and not the other studies of a means to achieve peace. This is what we have to direct our attention to.

TAYLOR: Coming from an organization that deals mainly in practicalities and hardly has any time to deal in concepts, I had a certain sense of unreality this afternoon when listening to the discussants. On the other hand, I can see the thrust and concern of the people who have spoken here on the various factors that relate to each other. Like everybody else, I have noticed the deluge of concern that has washed over countries and gone into other areas of the world as well as over the deteriorating environment.

As a matter of fact, it has reflected itself even in the Congress of the United States to the point where the printers are working overtime in the General Printing Office. There were 8,000 bills introduced in the 91st Congress dealing with one aspect or another of the environment. The noise and deluge

of printing is immense. Whether or not substance comes out of it is another question.

Over a period of years in this field I have noticed—and I cannot speak for other nations of the world—that we as Americans are motivated more by crisis than we are by long-term considerations. Let me give you a couple of examples of the field in which I am particularly involved at this moment, the field of health and safety in the United States.

For years, coal miners have been dying in dusty depths without anyone really caring. Then there would be a mine disaster, there would be a Congressional hearing, somebody would say something ought to be done about it, the boards would be appointed, and in the meantime the spectacular disaster would become a past memory, and unnoticed thousands of miners would be slowly deprived of their health by pneumoconiosis. These problems never hit the newspapers, because the miners die or are disabled quietly.

In 1968 there was a major disaster at Farmington, W. Va., in which some 70-odd people were killed. This happened to come just at the right moment, the outcome of which was the enactment of the Coal Mine Safety Act. It is my opinion that had there not been an accident, we never would have got that legislation. We had another situation involving a smaller number of people, notably the underground uranium miners who mine ore on the plateaus in Colorado, Wyoming, and Utah; this is a work force that has never totaled more than 6,000 people. Some very dedicated epidemiologists with the U. S. Public Health Service finally determined that anywhere from 600 to 1,000 of these people would die—many of them had already—as a result of the inhalation of gas. It was not until we broke the story in the newspaper that something was done about it. Finally, a strong standard was adopted by the Secretary of Labor against the institutional objections of the Atomic Energy Commission, the Joint Atomic Energy Committee—all of whom have this problem, which is perhaps not true in other countries but is true of the development of nuclear energy in this country; that is, the AEC has the responsibility for both development and regulation of the use of this resource.

As a result, it is uranium development that has the front page, and the tail end of the stick is the protection of workers, although it must be admitted, frankly, that the AEC has been more assiduous in protecting its workers from ionizing radiation and has had a smaller number of accidents in their operations; this crisis affects not only population exposure, but exposures of workers as well, an illustration of the built-in entrenchment of government organizations and private business against change for regulation because it might cause an unbalance or "restriction" on the operation of existing institutions.

Two professors who have been working for the Atomic Energy Commission, Dr. Gofman and Dr. Tamplin, have published a monograph (and have enlarged on it) that indicates that existing norms for exposure of the general population in the United States, if continued at the present level, would result in anywhere up to 10,000 to 30,000 more cases of leukemia. They recommend, therefore, that the population exposure norms set by the Federal Radiation Council be strengthened by a factor of ten. If this is done, workers who are exposed on the job to ionizing radiation, who receive ten times as much as the norms allowed for the general population, would therefore, if this theory is tenable and succeeds in holding its own in scientific debate, come in and ask that every establishment using ionizing radiation, strengthen their norms by a factor of ten.

I was approached by a representative of the Atomic Energy Commission and asked what the position of the AFL-CIO Committee of Safety and Occupational Health would be. I do not make policy, I merely suggest it. I am a staff man and not a mover and shaker. But I suggested to him that we had had an opportunity to review, in a kind of a quick way, both the Gofman and the Tamplin papers, and the response of the AEC. To a certain extent we found AEC's response self-serving. But I suggested that it might be an excellent idea to put the problem in the form of a debate before some scientific body that could make a conclusion as to the merits of the argument, so that it would not drag on and be used politically and otherwise. I suggested that such improper use would obscure an issue that, if it is as these two gentlemen say, would result not only in excessive leukemia and other types of disease caused by radioactivity to the general populations, but would enormously increase the casualties to our workers. The rejoinder to this was that these two men were crazy and the AEC would not dignify them by appearing on the same platform with them. I cannot understand this attitude. Either they are right or they are not. If they are right, they should not be afraid to stand up and be counted, and if no, then they ought to admit it and say "O.K., let us consider this." Fortunately, the then Secretary Finch, as Chairman of the Federal Radiation Council, which is an interagency group, had agreed to review all the existing views on the question, and perhaps something positive will come out of it. But in the meantime, the pressure from industry and the joint committee and the pressure from AEC is to keep things as they are.

The reason I mention this is that if there is anything that is needed right now in the whole environmental field, including the work environment to which I addressed myself, it is unbiased research. At the time when the United States and the medical profession were unable to bring themselves, because of pressure of the coal-mining industry, to say that there was such a thing as coal miner's pneumoconiosis, the English had already determined this and had been doing something about it since the 1930s. It wasn't until 1968 that, finally, the industrial medical profession and the Public Health Service came around to admitting that people were dying in the coal mines simply because the coal dust in their lungs was killing them off. The medical profession in the United States will not recognize that pneumoconiosis is a disease, but they have recognized it in England; they have recognized it for a long time.

I would hope, in conclusion, that this is not another gathering where we talk among ourselves and say, "Here are all the considerations." We have talked environmental pollution for years. The first study that was made in the administration of Teddy Roosevelt, the National Conservation Commission in 1908, called for abatement of pollution. Pollution in the work place is something that apparently is keyed into the general environmental picture, yet 75 million people in this country are exposed to every kind of hazard in the world.

When I was a kid, living in Idaho, I was always told that bad weather was manufactured in Alberta, Canada, and then it all came to the United States. The most environmental bad weather is manufactured in the work places and other industrial places of this nation. We have to realize that the social consequences of this technology are something we are going to have to come to grips with. We all stand outside the decision-making area, but all of us are going to have to combine and make our voices heard; otherwise we will be an incestuous group that publishes papers, and that is the end of it.