

this field should be recognized as interesting, rewarding, and important. Proposals for organization, funding, and schedules which will assure the participation of excellent technical personnel in adequate numbers should be the joint responsibility of Government and private sector research and development leaders.

Accordingly, another aspect of our activity concerns our responsibility for getting the scientific and engineering communities involved in the problems of the environment. There is no lack of interest, rather the questions asked are how rather than why should we help. Each of the divisions of the National Research Council has had representatives attend one or more of our meetings and we have discussed with them the precise nature of some of the scientific problems which need solutions. We are working closely with the American Chemical Society, the American Institute of Chemical Engineers, and other professional organizations, to make sure that the effort is coordinated rather than fragmented. The interest of scientists and engineers is so great that small groups have sprung up in many places and in many disciplines each trying to make some contribution. You need have no fears about the concern of the scientific and engineering community nor their willingness to help. The problem at the moment is to break the major unsolved questions into manageable problems and to concentrate the effort on them.

I have already stated that the individual problems of the contamination of the environment are inextricably intertwined with each other insofar as the technical solution to one considered in isolation almost always complicates the solution to another. But there is complexity of other kinds as well.

Contamination of the environment cannot be adequately examined without taking into consideration the questions of availability and conservation of natural resources. Standards of purity of effluents cannot be set without taking into account the ultimate use or disposition of the effluent. The complexity of the relationships between the health of individuals and their environment is such that it is improbable that we will soon have incontrovertible evidence permitting one to set absolute limits of tolerance for contaminants. In such circumstances it is tempting to try to play safe, to set limits very low. In all of our human activities we take risks. We put up buildings and live in areas subject to violent earthquakes or hurricanes. We do most of our long distance travel by air. We do much of our shorter distance travel by automobiles. The problems of environmental pollution must be looked at in the same way, by balancing risk against convenience, against cost, against feasibility. Our solutions should represent an overall balancing of these and other factors such as recreational use of land and waters.

The charter of the ESB is a broad one and we have interpreted it broadly. We have recognized that the solutions to environmental problems involve not only the physical and biological sciences but also questions of law, of political science, of economics, of sociology, of psychology. There can be alternatives, for example, between institutional changes and technological solutions, for example, between a multistate-multimunicipality water basin authority which might provide a few centralized treatment plants and the treatment of all effluents individually at their sources. The feasibility of an institutional structure can thus determine the direction in which technological progress should be sought.