

tical to prevent and what might be truly harmful. It is never above what could be harmful and always is established at a level which is practicable to achieve and which is measurable.

In summary, any realistic enforcement program for environmental quality must have its basis in the state of knowledge and capability to establish standards or criteria and must envision sufficient flexibility to accommodate to changes as improvements in knowledge, or alterations in situations occurring. It is evident that in order to avoid unrealistic programs for public expenditures as well as those in the private sector that there must be a high degree of communication between the various disciplines involved including those of law, political science and economics, as well as of ecology and environmental engineering and science. Of even more importance to any realistic program is the improvement of communications between the specialists and the public at large.

*Question 2: You have mentioned the need for a national plan for the Federal departments and agencies for environmental pollution abatement. Would you discuss further how the systems approach could be used in this effort?*

Answer: In developing a national plan for environmental pollution abatement, it is essential that the three principal problem areas, namely, water pollution, air pollution, and disposal of solid wastes be viewed as part of an integrated larger effort to provide for the utility of the Nation's environment and resources for the future as well as for the present. As has been widely recognized by the subcommittee, there would appear to be solutions to certain of the pollution problems which may not take into account the fact that they in turn create or intensify others. Burning of refuse or disposal of it into so-called sanitary land fills instead of grinding it up and disposing of it through the water-borne route is a case in point. In the first instance, burning may create an air pollution problem, which admittedly might be offset by proper wet scrubbing and disposal of the residue from the burning operation. The extra cost of collection and transporting of the solid wastes might well be offset by the recovery of the heat energy of the waste and its use for power production (which the Department of Navy is currently experimenting with). However, in the zeal to overcome the pollution problem, the fact may be overlooked by some that grinding of food wastes at the point of origin and that prompt disposition into the water carried systems eliminates a source of rodent and fly breeding with attendant hazards of transmission of intestinal diseases.

There is a tendency in evaluating the potential of systems engineering and systems analysis to look at "objects" rather than the basic concept. Admittedly some of the byproducts of modern space technology which have been incidental to our systems approach do have an application to the problems of environmental pollution abatement. Some of these have been cited in our prepared testimony. Another byproduct which well might be investigated is the use of nutrient rich sewage effluents for the production of protein rich algae which could be utilized for animal foods or possibly, with sufficient refinement, for human consumption.

Be that as it may, the fundamental requirement in the environmental pollution problem is the need for the efficient allocation of resources.