

industrial economy. There is neither historical warrant or any basis for prophecy that anything of this sort is likely, or even possible.

We have used legislative means to modify our economy many times, both by prohibition and by economic forces. Controls related to industrial health and industrial minimum wages are obvious examples. So long as we implement whatever decisions about the environment an informed public may demand, in ways that leave to our firms their traditional freedom of choosing how they operate within necessary constraints, I see no danger to our industrial economy, only a further change in its own evolving environment.

Turning to questions 42 to 44 from paragraph E(7):

Is the response of humans the proper measure in ecological management? How can environmental quality options be made subject to market appraisal? To what extent can esthetic experience be quantified?

Direct effects on humans are certainly not the only basis for decisions and balances concerning environmental quality. If our environment were much more inhospitable than it is, we would probably have to value the health of our food plants above all else, including human health. No rational environmental policy could give less than great importance to food and fiber and to all the forms of life involved in their growth.

I believe, and I am sure that the other members of the PSAC Panel join me in believing, that civilization in this country is far enough above the level of bare subsistence for its people to look upon the quality of their life as important and subject to improvement. This means that quite indirect effects on humans, either now or in the future, can properly contribute to judgments and decisions about the management of our environment and our economy.

I am a firm believer in market appraisal wherever it can be given effective play. But we must be keenly aware that many of the most vital aspects of governmental activity are not given, and so far as we can see cannot be given, market appraisal. Health, education, highways, police protection, and national defense are not appraised in any market, though we are all concerned that judgments about them are made carefully and with the best possible guidance. I see no reason why our choices about our environment do not deserve similar attention.

The valuation of esthetic experiences in monetary terms is obviously difficult. We are used to doing this indirectly, by making decisions and judgments whose consequences are those that would also flow from optimizing some expression in which these experiences would have certain monetary values, but this is far from actually valuing these experiences in monetary terms. In my own judgement, it will be a long time before we can wisely shift to much more explicit valuation of esthetic experiences. For special, often unimportant purposes, it is, of course, easy to quantify certain esthetic experiences.

Turning back now to questions 4 to 7 from paragraph A(2):

How far can new technology development proceed without comprehensive waste management systems analyses as guides to the allocation of scientific resources? What are the limitations and opportunities for systems analysis in environmental management? Is there an adequate modeling technique? Are the input data available and accurate?