

wonderfully clean and efficient, although there are sometimes differences of opinion about the environmental aspects of building dams, regardless of the cleanliness of the electric generating process involved. There still remain a significant number of opportunities to install more hydroelectric generation facilities in the United States—and in a manner supporting the objectives of conservationists.

But the matter of greatest interest to those worried about pollution is the news about nuclear power. First of all, economic nuclear power has come of age much quicker than earlier predictions. Nuclear stations are being installed at a rate far ahead of even the most optimistic predictions of a few years ago. It is difficult to overstate the scope and importance of the revolution in power generation we are experiencing right now.

The nuclear news is especially interesting for those concerned with pollution because the cleanliness of nuclear powerplants also has exceeded expectations. There are, of course, no combustion products at all. And the amount of radioactive material emanating from these plants is so small that it is even less than the very tiny amounts of radioactive waste emitted by conventional coal-burning powerplants as the result of radio nuclides occurring naturally in coal.

Well, with a few digressions, I have mentioned nine specific areas of technology where I believe there are opportunities for research that may help in the job of pollution abatement.

Certainly, there are many additional opportunities for research to help improve our environment. Those I have mentioned seem particularly important to me because I am aware of research progress in all of them. Success in many of them—if not all of them—seems inevitable.

But I am not at all satisfied that enough research is being done in any of these areas. Which brings us to those two difficult questions: Who is going to do it? And who is going to pay for it?

I should like to make some comments on these questions, but I certainly don't want to suggest that I have all the answers.

It may be helpful to divide the kinds of research opportunities I have been discussing into a smaller number of classifications. We need research aimed at giving us better ways to find out what pollutants are in the air and water—and when—and how they got there. We need research aimed at learning the effects of these pollutants—especially on people. We need research aimed at keeping certain pollutants out of our environment in the first place. We need research aimed at removing pollutants from our environment.

Research in these various classifications of "monitoring," "causes," "effects," "preventive regulation," "preventive technology," and "removal" can be further consolidated, for purposes of this discussion, into two categories:

One, research that will produce information useful for establishing standards, determining necessary regulations, enacting appropriate laws, and suggesting methods; and

Two, research that will produce information useful in developing hardware and system than can be manufactured and sold.

In the first category is much of the needed exploration about the causes, effects, and preventive regulations of pollution.