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Preventive Technology: A Cure for Scientific Ills

Scientists want very much to spend more of their time on science and less on its defense. They are making it apparent that they want to talk more and listen more to science at scientific meetings. At the annual AAAS meeting in January 1975, sessions on specific scientific topics were more popular than sessions devoted to policies, effects, and other themes peripheral to traditional science.

At the same time, there is no lessening of concern over unanticipated, unwanted fallout from scientific advances. The public has associated nuclear physics with the hydrogen bomb and damaging radiations from nuclear power plants, computer science with an undesirable "data bank" society, and the development of synthetic plastics with environmental pollution. The public is correctly concerned. But public and scientific intelligence both do poorly in deciding which is worse—the disease or the cure, the problem or the solution.

The generic problem is simple. Scientists should advance science. Technologists should continue to apply scientific advances to change the products, services, and processes that support society. All harmful effects should be prevented through combined public, governmental, and scientific agreement. And above all, scientific advances should not take the public by surprise.

The solution to the problem is not in successive cures to successive science-caused problems; it is in their prevention. Unfortunately, cures for scientific ills are generally more interesting to scientists than is the prevention of those ills. We have the unhappy history of the medical community to show us the difficulties associated with trying to establish preventive medicine as a specialty.

Scientists probably had more fun developing scientific defenses against nuclear weapons (that is, cures) than they would have had practicing preventive nuclear science during the development of the atomic bomb. Computer scientists find it more attractive to develop technological safeguards, after the fact, to prevent invasions of privacy associated with computer data banks than to develop good information practices along with the computer systems.

However, it now seems quite clear that public patience with the cure always following after the ill has worn thin. The public wants to see some preventive measures taken. Indeed, individuals have taken what can be called preventive technology into their own hands. We have seen the public in action in this way in its handling of the supersonic transport issue and its reaction toward siting of nuclear power plants. This is the reactive mode of practicing preventive technology, and it hinges on public recognition that technology is fallible. But it is important in practicing preventive technology to also recognize that science has been the primary cause of beneficial change throughout man's history.

It is now time for the formalization of preventive technology as a scientific specialty. This new field must be populated with economists, lawyers, technologists, and scientists. It will be practiced during the entire cycle of research, innovation, application, diffusion, and impact of technology. It will make possible both more science and more public peace of mind and may already have more focus than technology assessment or science policy. It is safe to predict that delays in setting up preventive technology as a scientific specialty bode ill both for science and for future beneficial changes for society.—RUTH M. DAVIS, *Director, Institute for Computer Sciences and Technology, National Bureau of Standards, U.S. Department of Commerce, Washington, D.C. 20234*