

ing painfully that the laws of nature cannot be overturned by human fiat. It has taken a long time to attain this rational attitude; we are now conscious of the consequences of intolerance in the past. Perhaps this is why we are so tolerant toward those who claim the right to use technology as they see fit, and who treat every attempt by society to regulate such use in the public interest as if it were a modern repetition of the persecution of Galileo.

The right to be protected by law against injurious action by others is basic to civilized society. Yet, opponents of legislation intended to restrain use of potentially dangerous technologies are often able to prevent or delay enactment of such laws by playing upon the layman's respect for science. It is their common practice to argue as if at issue were a law of science when, in fact, what is being considered is not science but the advisability or legality of the technological exploitation of a scientific discovery. The public would not be deceived by such arguments if it clearly understood the fundamental difference between science, which is *knowledge*, and technology, which is *action* based on knowledge.

To guard against being misled, one should cultivate an attitude of skepticism whenever the word "*science*" is used. Is it science that is being discussed or is it technology? If technology, the question at once arises whether the proposed action is legally permissible and socially desirable. These are matters that lie outside the domain of science. Just as the law of the cosmos cannot be overturned by human fiat, so is human law supreme within its own proper sphere of operation. Technology must therefore conform to that most basic of all human laws, the maxim of the "mutuality of liberty," the principle that one man's liberty of action ends where it would injure another. Without this maxim, freedom would be a barren privilege.

Whether or not a particular technology has harmful potentialities should not be decided unilaterally by those who use it. For the user, destructive technologies are often highly profitable. He is, therefore, an interested party to the conflict between private and public interest that every potentially harmful technology poses. Nearly always he is also a practical man.

I think one can fairly say that the *practical* man's approach to a new scientific discovery and its technological exploitation is *short-range* and *private*, concerned with ways to put scientific discoveries to use in the most economic and efficient manner. Rarely will he give thought to the *long-range* and *public* consequences of his actions, that is, to the effects that a new technology may have on people, on the nation, on the world; on present and future generations.

To illustrate the disastrous consequences of a narrow practical approach, let me give some examples of technological damage to our national environment.

Carelessly emitted, the waste products of new technologies create a massive problem of soil, water, and air pollution. We may be permanently damaging the atmosphere by changing its chemical composition. New products, profitable to manufacturers and useful to consumers, are often themselves intractable pollutants. For instance, detergents which unlike soap do not dissolve in water, or pesticides and weed killers which, carelessly applied, will poison soil, crops, birds, animals, fish, and eventually man.

Other technologies enable man to alter the very contours of the land—as with new strip mining machinery. Because it cuts the cost of extraction, such machinery, is used in some places. Huge chunks of earth and rock with their topsoil and vegetation are gouged out, changing fertile country into a desolate lunar landscape—a land robbed not only of its irreplaceable mineral wealth but of its fertility as well.

Man now has the means to slaughter all the wild animals on earth and he is well on his way of doing so. Consider what has been done to the vast riches of the seas.

With modern techniques, deep-sea fishing is so efficient that a few enterprises could rapidly sweep the oceans free of commercial fish. And this is what fishermen of all nationalities wish to do. As practical men they have no other interest than to use the latest technology that will increase their catch, preserve it and get it to market speedily as possible.

We witness at the moment the end of one of the saddest cases of misuse of technology by greedy fishing interests. Unless these interests are curbed by truly effective international action, the great whales—the blue, the finback, the sperm—will soon disappear, victims of man's "practical" folly.

These and other whales once populated the high seas in immense numbers. For hundreds of years whaling remained a reasonably fair contest between man and the intelligent, swift-moving mammals he hunted. Modern technology has turned it into brutal genocide. Blindly pursuing what they doubtless consider