

## 'Science Cannot Give Us Values'

THE two greatest hazards to world peace—overpopulation and the widening gap between the rich and poor nations—are both aspects of the incompleteness and haphazardness of the technological revolution, but they are not the only ones.

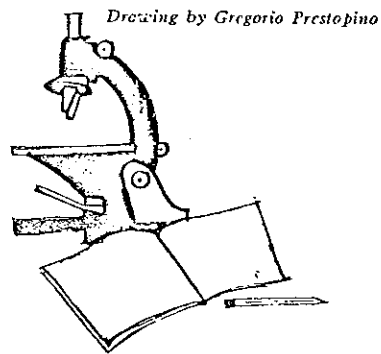
Technology and production have too often been allowed to become ends in themselves. Social engineering attempts to make men fit neatly and uncomplainingly into factories and corporations. Depth advertising is used to make the consumer buy what industry wants him to. The conclusion is inescapable: the direction that technology has taken in our society has been determined by the chance workings of the desire for individual or corporate profits—and by the needs of the military. A booming economy is no more a boon to man than is a robust war machine, unless production and wealth are for man's use, not for their own sake.

Science has had a profound impact on Western culture, but the response has often been a superficial attempt to copy the techniques and attitudes of science without assimilating its substance. One example is the use of specialized jargon. Technical vocabulary has a very useful function in science, namely to provide a language with precise meaning. Ironically, although the use of technical terms in science facilitates very accurate understanding among specialists in a given area, it hinders communication between specialties even within the same science. Regrettably, "scientific" jargon is often used by nonscientists for whom plain speech would certainly be preferable. Another example is the way in which the compartmentalization so harmful in science is copied by those modern artists and musicians who create (and write about) works,

Joel R. Primack of Granada Hills, Calif., had highest academic ranking of Princeton's Class of 1966, and this article was adapted from his Valedictory Address in June. A Phi Beta Kappa physics major and University Scholar, he won the Albert G. Millbank Memorial Prize last fall as the senior with the highest three-year average. He has worked four summers at the Jet Propulsion Laboratory of the California Institute of Technology, which he will enter this fall for graduate study.

not for the public nor even for posterity, but merely for the appreciation of some small coterie.

More serious, I think, is the way our culture has responded to the characteristic *objectivity* of science. Other disciplines—including even literature, philosophy, and religion, the traditional repositories of human values (as distinct from knowledge)—have evidently grown envious of the sort of success that science has achieved. But if they attempt to adopt the scientist's disinterestedness and moral



neutrality, their entire point is lost. Yet another unfortunate reaction to scientific objectivity and technological efficiency can be found in industry and commerce. There, objectivity superficially translates to impersonalness; and the notion of interchangeable machine parts leads to the notion of interchangeable people.

The view that science can and should become the central foundation of our culture is fairly common today. But there are at least two reasons why this is impossible. First, science can never supply values—can never tell us what ought to be, merely what is. Second, science is not, and probably cannot become, a unifying agent. Indeed, there are many forces in science for disunity. One of the least fortunate consequences of the modern devaluation of the humanities is felt in science itself; for the centrifugal force of specialization is no longer adequately counterbalanced by the desire for common understanding and shared culture.

WELL, then—what is to be done? First, I think that anyone who would call himself educated and who

aspires to a position of leadership in our society has the responsibility to understand science and technology, and to incorporate them in a less superficial way than is customary into his *weltanschauung*. The sort of understanding that is necessary takes two forms: understanding of the techniques and the technological devices common in modern life, and appreciation of the basic nature and inherent limitations of science. If a person has no idea whatever how an electric motor works, or a radio, or a rocket—or if he does not realize the capabilities and the dangers of technology and science—then modern life must seem threaded through with magic, and the "experts" become awesome sorcerers. Such complete dependence on experts is especially unhealthy in a democracy.

The second task that we can neglect only at our extreme peril is that of applying science and controlling technology consciously and purposefully for good ends. Experience has shown that it is not wise—indeed it is not safe—to continue to trust the profit motive and the needs of the military to guide technology. It is time to provide the technological revolution with a moral and aesthetic foundation. We must strive to restore a proper balance to our culture by placing humanity firmly in the center. The greatest and most characteristic achievements of Western man are in aesthetics and in the humanistic recognition of the intrinsic importance, worth, and dignity of each individual—as well as in science and technology. The results can only be disastrous if science reigns alone and supreme.

A great university like Princeton is perhaps the chief repository in our civilization of humanism, science, and art. As the recipients of a liberal education and the inheritors of the humane values of Western man, we assume the privilege—but also bear the responsibility—of understanding and directing the great power which science has put within man's grasp, for decent and noble purposes: for the creation of a better society and a better world.

—JOEL R. PRIMACK