

Education and Science in a Mature Society

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DURING recent years self-examination by many thinking Americans has evolved extensive criticism of our educational system.

On the one hand, just after the war the criticism was engendered largely by the apparent political naivete of some engineers and scientists. This unawareness on their part contributed to several unfortunate incidents and made the public sensitive to the need for political and cultural sophistication on the part of scientists. Our professional schools were criticized freely for providing curricula so narrowly technical that they did not produce wholly educated people. This criticism was just. No one disputes the need for broad education in scientific and engineering schools.

On the other hand, the onset of the space age and its implications have pointed up the need for ever-increasing numbers of scientists and engineers; now the criticism of our schooling system is driving us towards increasing the number and quality of technically trained people. But the full realization of new technological standards in education cannot come about without some infusion of science into the political influences that determine our standards of education.

Recent criticism has been along the lines that our modern educators have gone too far in the direction of permissive schooling, that we have departed from rigorous discipline and have been victimized by "progressive" educators. Unquestionably some of this is true now, as it has always been. However, if we revert to the criticism of ten years ago, centering about the lack of political education among scientists, we find that it was not at all accompanied by a criticism of the lack of scientific education among politicians, although it must be fairly obvious that such a lack would undermine the basis of improvement of the scientific status of the community.

It seems to be a fact that most of our political leaders, both domestic and international, have educational backgrounds in liberal arts, economics, law, and the social sciences. A cursory look at the curricula for these courses, even in the best schools, for both undergraduate and graduate work, shows an appalling lack of science. Remember that technology is a dominant key in modern society. And yet, we educate people ultimately to become leaders of this society with no more scientific

knowledge than is included in a one or two-semester "survey" course. As a result, they never develop the slightest understanding of either the aims of scientific research or the methods of engineering development.

Consider the plight of an administrator, a business executive or legislator, making decisions or voting on policy questions of dramatic consequence to the whole nation, although not equipped to understand even the simplest scientific or engineering problem. How much postwar major international policy was predicated on the assumption that nuclear weapon development was based on "secret" processes. This happened despite the frequent assertions of scientists that there was no "secret," and that one nation could duplicate the performance of another in a short time. They were ignored under the popular assumption that since scientists were uneducated politically, politicians were, perforce, well educated technically.

There is no intent to apply this criticism solely to people concerned with public affairs. As a matter of fact, legislators, administrators, and businessmen reflect the prevalent opinions of the public more often than not, and this is as it should be in a democratic country. Unfortunately this public opinion is often uninformed, or worse, misinformed. Lay concepts of science are too frequently based on the Hollywood picture.

All this means that the situation must be corrected at its source. A sharp increase is called for in the amount of scientific education in a general curriculum. A high-school physics course or one year of college chemistry and no mathematics do not provide sufficient educational breadth to prepare a man for intelligent political or business management.

Worse, an alarming number of our present educators, by virtue of their own inadequate elementary scientific training, are perpetuating these standards for our next era of educators! This degenerative chain must be broken.

The civilization and maturity of a future society will depend not on having a swarm of trained robot scientists at the disposal of a nontechnical directorate, but on a blending of the goals of technology and political and social science. This will be achieved only as a result of a mutual appreciation, stemming from a common educational background, that provides a sound scientific understanding in addition to an awareness of political and social responsibility.

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