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Education for the 21st Century

Education stands out as the best basis for hope that this country and others will somehow manage to avoid enormous trauma during the transitions that lie ahead. But are young people being well counseled in preparation for the 21st century? What will be the shape of the future and the corresponding demands for trained people?

We have lived in an era of conspicuous consumption, rising expectations, and exponential growth. We have entered a period of uncertainty, conflicts in value systems, and possible decline in living standards. We face the necessity of creating an economy based on less oil, less energy, and changed raw materials. Society will not and cannot return to the Stone Age or even to a universal simple agrarian existence. It will not abandon knoweldge nor the ability to harness it. There will be no shortage of people ready to tell the politicians what should be done. There will be no shortage of instant solutions. But there may be a shortage of trained people capable of meeting society's physical needs.

In many ways the educational system is excellent, but in at least one respect it can be faulted. Its overall performance in counseling the young has been mediocre. Universities have practiced a policy of conducting an intellectual smorgasbord.

Since the students have not received adequate guidance from the educational institutions, their decisions have been based on other sources of information, notably the media. In the past this has resulted in some tragic wastes of talent. The hoopla of the "space age" led to career decisions that brought later disappointments. A lesser example was a vogue in oceanography. Currently it is fashionable to attempt to go to medical school. The pressures are easing somewhat but an enormous wastage continues. Stories appearing in the media can now attenuate the flow. A notable example a decade ago was the impact of a few stories about engineers driving taxicabs. Only now have enrollments in engineering recovered from the slump.

A basic problem in providing career guidance is that no one knows precisely what will be needed decades hence. In addition, at the universities campus politics gets in the way. At a time of budget squeezes and of departmental support based on enrollments, the fight for survival makes it difficult for faculty to be objective in advice. Another problem is that neither individual students nor their potential counselors can accurately gauge aptitudes, talents, drive, and judgment at the time of entry into the university. Few students are aware of their own potentials or are in command of themselves. An additional complication for potential scientists and engineers is that many curricular decisions are, in practice, irreversible. Basic courses in mathematics, chemistry, and physics must be taken in a timely fashion or options are foreclosed.

Whatever the changing shape of society, scientists and engineers will have essential roles. The uncertainties, though, make it advisible to caution against excessive specialization. In contrast, it seems desirable to adopt policies of maximum flexibility, of preservation of options, of being prepared to pursue lifelong learning.

For those who are capable of handling mathematics and abstract reasoning, this means building the necessary foundation in mathematics, chemistry, physics, and engineering design as well as obtaining adequate competence in verbal and written communications. Those with the necessary aptitudes should also be exposed to biology, earth sciences, behavioral sciences, and the humanities.

One cannot insist that students with no aptitude for the hard sciences take the fundamental courses, but it is difficult to visualize how they could be comfortable in the world of tomorrow without some inkling of the forces shaping their lives.

For their part, the universities should have a searching look at their counseling policies. There must be better ways than entrusting young lives to a hit-or-miss system.—PHILIP H. ABELSON