

several generations of slums of engineering and piles of junk.

Another valuable consideration is to check competition in technology when an enterprise reaches a size and expense that makes it a natural monopoly that should be regulated in the public interest or nationalized. At present, I think, this applies especially to automating, where it is absurd to duplicate immense concentrations of tools, though it might be wise radically to decentralize the programming. It certainly applies to the crazy competition in exploring space.

Such a moral program is, I say, obvious; yet it is revolutionary and beyond our present political means. We can legislate, and exact penalties for, hazard, dishonest claims and malpractice, but not for slovenliness, childish gluttony, callousness about the community, and indecency. Then the public becomes resigned. Nevertheless, in my opinion, a lot would be accomplished if technicians would take the lead and insist on acting like professionals. Common people would follow their lead and find political means. It is endlessly amazing how people spring back to life and good instincts if they see a glimmer of hope; there is a dramatic reversal in the opinion polls.

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Much could be accomplished also by a different kind of mass education in science. I agree with the current wisdom that in a world pervaded with scientific technology, a great part of the curriculum must be scientific. The question is for what purpose and how. At present, there is a laudable effort to teach the excitement and beauty of science and natural truth, and to get great men to give the TV

lessons. But the chief purpose of most recent curriculum reform seems to me to be wrong-headed: it is to process Ph.D.s or even to educate creative scientists; and the method is to teach the latest findings. The time of the vast majority who are not going on to scientific careers is wasted. Yet it is likely that most of those who are scientifically gifted will follow their bent anyway, quicker than they can in standard courses. We really do not know how to educate for creative genius. And it is not the case, as is claimed, that in a high technology average workmen need extensive scientific schooling; on the contrary, a few weeks to a year on the job, rather than years of lessons, is still the best way to train adequate low-level technicians.

Entirely neglected in the present curriculum, however, is what science *is*, as a way of being in the world. For instance, its austerity and honesty. For this it is worse than useless for the average student to learn answers for the College Board examinations. This turns the whole thing into an abstraction or a hoax. The student ought instead to be scrupulously reporting what really happened in his laboratory, why his experiment did *not* "work out"—of course, it has worked out some way or other. This would certainly teach respect for fact and it might even lead to insight.

There should be heavy emphasis on coming to be at home in the actual technology, making model machines, and learning to repair intelligently the usual standard machines. This was the scientific program of classical progressive education fifty years ago, to make critical and self-reliant users in an industrial society, to restore the sense of causal control of things rather than feeling powerless among things.

As part of social studies a major subject should be the economics, politics, and organization of science and technology. I do not see