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Gentlemen:

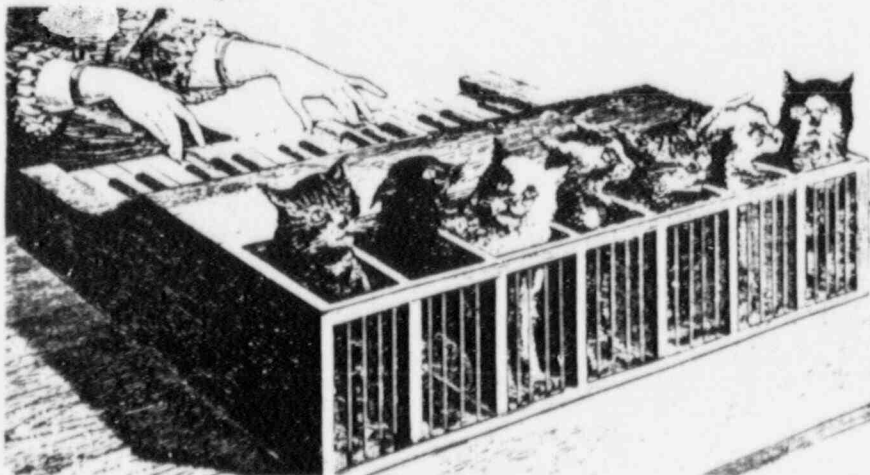
I was pleased to read in the paper today that the NRC proposes "to ease emergency standards for nuclear plants". This has my unqualified approval, as I understand the steps to be taken.

I am tired of the patty-cake politics in this matter. If Massachusetts cannot handle an evacuation from Seabrook, they can turn the 10 mile circle over to the aegis of New Hampshire and let somebody do the work that can do the work, instead of bitching about why they can't do it.....I don't know what can be done about Shoreham. Maybe Long Island can secede from New York and set up the 51st State?

As for Senator Kennedy's trumpeting about "Seabrook is not safe", what the hell does he know about what is safe and what is unsafe?

Very truly yours,

J.B.Lankes, P.E.  
"cassandra, jr."



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## The Decline in American Comprehension of Science

There is today a growing discrepancy between the science, mathematics, and technology education acquired by high school graduates who plan to follow scientific and engineering careers and those who do not. Scientific and technical literacy is increasingly necessary in our society, but the number of our young people who graduate from high school and college with only the most rudimentary notions of science, mathematics, and technology portends trouble in the decades ahead. Thomas Jefferson's axiom that an enlightened citizenry is the only safe repository of control over the ultimate processes of society surely includes the necessity for scientific and technological enlightenment. While students who plan scientific and engineering careers are receiving an adequate educational foundation, more students than ever are dropping out of science and mathematics courses after the tenth grade, and this trend shows no signs of abating. The situation has several troubling implications:

- The role of science and technology is increasing throughout our society. In business, in government, in the military, in occupations and professions where it never before intruded, science is becoming a key to success. Today people in a wide range of non-scientific and non-engineering occupations and professions must have a greater understanding of technology than at any time in our history—yet our educational system does not now provide such understanding.

- Students who take no more mathematics and science after their tenth year have effectively eliminated, by the age of sixteen, the possibility of science or engineering as a career. The pool from which our future scientific and engineering personnel can be drawn is therefore in danger of becoming smaller, even as the need for such personnel is increasing.

- Education has long been the route by which upward mobility has been achieved by disadvantaged groups in our society. This verity has not changed. Increased emphasis must be given to aiding those who have been excluded, for too long, from careers in science and engineering. We stress this imperative both for reasons of equity and to increase the size of the pool of talent from which the Nation's scientists, engineers, and technicians can be drawn.

- The declining emphasis on science and mathematics in our school systems is in marked contrast to other industrialized countries. Japan, Germany, and the Soviet Union all provide rigorous training in science and mathematics for all their citizens. We fear a loss of our competitive edge.

The contribution of science and technology to our security and prosperity rests on two bases. The first of these is the competence and inventiveness of the practitioners, the scientists, and engineers who design and build the system. But the second base is equally important to our overall success as a Nation. This second base consists of the overwhelming portion of our population which has no direct involvement in science and technology, or with the science and engineering community. They are indirectly involved through their influence on the governmental and industrial sources of funding for scientific and technological endeavors. They are involved in the regulatory and policy decisions that set directions for scientific inquiry and technological development. They reap the benefits of science and technology. Many need some knowledge of science and technology to do their jobs well. However, the current trend toward virtual scientific and technological illiteracy, unless reversed, means that important national decisions involving science and technology will be made increasingly on the basis of ignorance and misunderstanding.

There has been, over the past fifteen years or so, a shrinking of our national commitment to excellent and international primacy in science, mathematics, and technology. This lessening of commitment has not been the result of conscious decision on anyone's part, but it has nevertheless pervaded our society. The schools of this Nation are but reflections of the degree of national commitment in any area, and they therefore are not so much a cause of this condition as a result. To correct this debility, therefore, will require that attention be given

not only to the schools themselves, but also to increasing public understanding and appreciation of the importance of excellence in these areas.

Lest you are thinking that a smug Canadian writer is looking down on a distressing aspect of the American scene, at this point I must advise that the foregoing is taken, verbatim, from an October, 1980 report by the (U.S.) National Science Foundation and the Department of Education, prepared at the specific request of President Carter. The report is signed by Shirley M. Hufstetler, Secretary of Education, and Donald N. Langenberg, Acting Director, National Science Foundation. The title is "Science and Engineering Education for the 1980's and Beyond." The 79 page report is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 (Code No. 1980-0-334-588/6998).

I found the report most interesting, and commend it to my readers. Only a few other excerpts can be quoted on this page, such as:

- We are distressed by the fact that the majority of adult Americans who have already passed through the system have received an education which is inadequate to their needs as citizens in today's technically complex world.

- There is a great mismatch between the content of secondary school science and the needs and interests of students for whom these courses will constitute their entire formal scientific education. With few exceptions, these courses are not directed toward personal or societal problems involving science and technology; nor do they offer any insight into what engineers and scientists do; nor do they have vocational relevance except for the chosen few.

- The school curriculum barely considers the role of the computer in our society. Just as we recognize the Stone Age and the Bronze Age, the Iron Age, and the Machine Age, historians are likely to look back on our own time and label it the "Computer Age."...The computer is revolutionizing the way business and industry are conducted, and thus the nature of many jobs. The small calculator is ubiquitous, appearing even in the hands of kindergarten children. Examination of school curricula, however, would, by and large, offer little evidence of the existence of this electronic revolution.

- There is persuasive evidence that many students today are simply not aware of the career opportunities which exist in scientific and technological fields. Many of them apparently have the misconception that the only people in these fields are those with advanced degrees and if they are not top academics, they need not apply. This is particularly true of women and minority group members, who are grossly under-represented in scientific and technical fields.

I can add a personal experience to this discussion. In 1966, while attending the International Congress on Metallic Corrosion in Moscow, I observed books on chemistry, physics, and mathematics laid out on tables for sale to the public in front of bookstores, and in the subways also. A subway rider I met who could speak English told me that he was returning home at 11 pm after a three hour period of night school that he took three nights a week. In reply, I told him that in Canada, a night school student would consider himself working hard if he spent two hours a night twice a week. And my Russian friend was married and had two children! When I wished him well in the furtherance of his career (technical translator), he observed, apologetically (!), that in Russia this was the only way to get ahead.

In my opinion, one of the most important concerns arising from the decline in scientific literacy among the population at large is the statement underlined above in the text quoted from the report.

*Hugh P. Godard*

Hugh P. Godard  
Editor

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