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Nuclear Safety: Is Scientific Literacy the Answer?

Last month 700 scientists, engineers, and technology watchers from industry, government, and academia gathered in San Francisco at the Edison Centennial Symposium, "Science, Technology, and the Human Prospect." The distressing events 3000 miles away at the Three Mile Island nuclear plant were not part of the agenda, but the accident nonetheless contributed to a defensive tone that prevailed throughout the 3-day conference. Some speakers and participants, alluding to both the media coverage and public reaction to the accident, deplored what they saw as widespread "scientific illiteracy" and called for public education in science and technology to forestall what one speaker referred to as a "Luddite revolt."

To the extent that this view, reminiscent of Sputnik days, represents an instinctive reaction of the scientific community to widespread public dismay with technology, its underlying premise deserves some critical comment.

Simply stated, the proposition seems to be this: If the public and media were more scientifically literate (for instance, understood the difference between dose and dose rate, or the meaning of "critical" or "hydrogen explosion"), then a wider consensus on such issues as the safety of nuclear power could be expected. The public reaction to the issue would then be less emotional, more rational.

This hypothesis can be readily tested by considering the extent of harmonious agreement on matters of nuclear safety that exists within the scientific community itself, presumably the best available model of a population possessing scientific literacy. A passing acquaintance with the nuclear safety position of various organizations supported by capable scientists, attendance at a nuclear-licensing hearing, or a day of eavesdropping in the corridors of several well-known government, academic, and consulting scientific organizations would show that scientists are, on this matter, no less influenced by personal feuds and ideological differences than the small-town clergy of a Trollope novel is on matters of ceremony and doctrine. I would go so far as to say that the divisions are deeper and more bitter among the scientifically literate than in the general public.

The paradox—that the best informed are the most confused—disappears only if we consider the whole nuclear power issue as merely symbolic of a deeper ideological rift, comparable to, say, the early 19th-century Romantic revolt. One might wonder whether the whole nuclear safety issue even makes sense in the absence of a deeper societal conflict; presumably a rational visitor from outer space (or perhaps even from China) whose acquaintance with our culture was limited to the movie, *The China Syndrome*, and our mortality statistics, would conclude that the alarm of moviegoers was caused by the film's explicit portrayal of unsafe driving, drinking, and smoking habits, not the hazard of nuclear power.

If, as I am suggesting here, the nuclear safety issue is more of a quasi-religious than a technological conflict, then widespread improvement of scientific literacy is unlikely to improve matters. This is not to suggest that educators do not have an important task before them. Exposure and examination of the ideological aspects of the issue, using both traditional liberal arts and contemporary social science techniques, might do more to restore rationality than widespread improvement of scientific literacy. At the very least, development in young scientists and engineers of a critical ability to distinguish between technical and pseudotechnical social questions would seem desirable, if only to support their morale. As it stands, we have on our hands a generation of students so harried by today's pop ethics that many of the best consider careers in a regulatory bureaucracy or a romantic retreat to the design of small tools as the only remaining respectable form of scientific or technological endeavor.—RICHARD L. MEEHAN, *President, Earth Sciences Associates, Palo Alto, California 94304*