

Division of Professional Relations  
1155 16th Street, NW  
Washington, DC 20036

DENNIS CHAMOT, *Editor*



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## FROM THE EDITOR . . .

### Report from Los Angeles

#### Henry Hill Award



Bill Bailey receiving Henry Hill Award from Fred Owens, 1987 recipient.

Photo: C&EN.

DPR's Henry Hill Award was presented at the Los Angeles national ACS meeting to Dr. William J. Bailey. Long associated with the University of Maryland, Dr. Bailey has had a distinguished career in polymer chemistry, and has trained a generation of chemical researchers. He is a past president of the American Chemical Society, and has been one of the most active and outspoken proponents of professional relations activities for many years.

The well-attended award ceremony followed the conclusion of a DPR symposium on problems and opportunities for experienced chemists, and Dr. Bailey indirectly continued with that theme in his remarks. He pointed out that industry needs to be educated about the problems they create with massive early retirements. We are wasting trained, experienced talent, he noted, making it difficult to maintain this nation's excellence in science. In addition, college youth are getting

the wrong message, that a career in chemistry may be cut off early. We need to educate corporations, said Dr. Bailey, that early retirements are not in their best interest.

#### Meetings

As usual, there were numerous meetings at the LA convention. A couple of items of particular interest relate to the Council meeting. PEG, the Professional Employment Guidelines, were revised, and passed. These guidelines form the basis of the multiple termination reports that are issued by the Committee on Professional Relations and subsequently published in *C&EN*, and also provide guidance in member assistance cases. They have become such a fixture on the ACS landscape that the revisions were passed without discussion. Actually, as is true for much of the business of the Council, discussions usually take place in the various committees and by other means, but controversial items usually elicit some additional comments on the floor. These did not, in tribute to the fine job done by CPR, and, I think, to the acceptance, finally, by the majority of Councilors that these are legitimate activities for the ACS.

If you would like a copy of the revised Guidelines, drop a note to Dr. Terry Russell, Manager, Professional Relations, ACS, 1155-16th Street, NW, Washington, DC 20036.

Surprisingly, the most controversial item, and the one that generated the most discussion, was a simple petition to amend the ACS constitution by adding the words, "Open meetings of the Society or its subunits shall be equally accessible to all members." Those who supported the petition simply wanted a statement that members cannot be barred from ACS meetings. This was surely done in the past for unsavory reasons (racism, for example). More recently, a member was denied entry to a local section-sponsored meeting because it was held on the premises of his former employer, and the employer objected to having the member there.

It was felt that *every* member of the Society has, as a minimum, the right to attend society meetings. Some of those opposed seemed to go to great lengths to read more into the

statement than was there, and then claimed that it was unclear and confusing. Note that the Council is the same organization that, over a period of time, added about *sixty lines* of "fair election procedures" to the ACS by-laws! I would guess that not one member in a hundred even knows of their existence, yet a simple statement of basic membership rights was subject to a huge debate, and then referred back to committee for further work by a two-to-one vote. I find it hard to understand. Do you?

#### Division Business

For the first time, the DPR Executive Committee met twice at the national meeting. As an established, vigorous division, there was much routine business to discuss. Of continuing importance was the subject of membership. Both our Council representation and our influence depend upon our size. You will find an application form in this issue. Why not use it (and a lot of photocopies) and get some friends interested in the *member-oriented division*.

By the way, on the subject of influence. You may not realize that your Division representatives have contact with ACS throughout the year. In my own case, for example, I have been called upon on several occasions to represent the chairman of the Council Committee on Professional Relations at meetings in Washington. I also deal with the staff of the Office of Professional Relations at various times, as well as the ACS office of Government Relations and Science Policy. In September, several members of the Executive Committee were invited to participate in a conference on professional relations called by President Gordon Nelson and President-elect Clayton Callis. In addition, there are Bulletins and newsletters to publish, elections to run, meetings to organize, and members to recruit.

We appreciate your support, and solicit your suggestions.

And sign up some friends.!

—Dennis Chamot

# BUILDING LINKS BETWEEN TECHNOLOGY AND SOCIETY

Hon. George E. Brown, Jr.  
Member of Congress  
36th Congressional District, California

As citizens of an industrialized country, we take for granted the predominant role that technology plays in almost every aspect of our lives. We depend on myriad technological innovations for comfort, convenience, and sometimes even for life itself. In fact, technology shapes what is possible humanly, economically, and socially.

Yet scientific and technological know-how is increasingly the bailiwick of a relatively small group of highly-trained scientists and engineers. To a large degree, the rest of us have become technologically illiterate, and complacent to let the "experts" make important decisions regarding new technologies. By encouraging narrow specialization, we have, in the words of an engineer at Pennsylvania State University, "created a nation of tourists in their native technological land."

Even so, public willingness to trust important decisions that could affect public safety and well-being to an elite group of specialists is on the wane. A number of environmental and safety hazards related to technologies such as nuclear power and chemical manufacturing have captured the attention of the general public. The release of methyl isocyanate at Bhopal, and nuclear accidents at Three Mile Island and Chernobyl, quickly elicited panic and fear in the most rational and disinterested of public citizens. With the exception of the dropping of the hydrogen bomb on Hiroshima, these events caused unprecedented popular interest in technological advancements.

The public soberly questioned the value of technology to society, while comparing the benefits of various technologies with their risks. Many turned a skeptical eye on nuclear technologies in general, some going so far as to protest publicly. Remembering the empty promises of the Atomic Energy Commission that nuclear power was completely safe and, on top of that, was "too cheap to meter," the public learned to distrust those representing the nuclear industry, and opposed all new nuclear power plants.

Although nuclear power has important advantages over other energy sources, public perception has been so severely marred that even if the nuclear industry could solve its immense economic, radioactive waste disposal, and safety problems, the public acceptance problem would be difficult if not impos-

sible to overcome. Needless to say, the nuclear industry could have done a far better job of researching and communicating the entire range of risks as well as benefits of nuclear reactor technologies.

The chemical industry is also the object of growing public distrust. The threat of chemical releases from manufacturing facilities and transportation accidents, combined with very little public knowledge of which chemicals are harmful, has caused many to approach the issue with "chemophobia," a fear of all chemicals. These fears have been worsened by the discovery of hundreds of hazardous waste sites releasing potentially toxic chemicals to the air they breathe and the water they drink.

Once again, industry slogans such as "Better Things for Better Living Through Chemistry" (with all apologies to DuPont) ring hollow. Despite innumerable benefits to society of the thousands of chemical products on the market today, the public wants to hear the other side. People want to know what they are being exposed to, and how it will affect them.

Leaving decisions about advanced technology to technological "wizards" can have other deleterious effects as well. Take, for example, the President's Strategic Defense Initiative, which was announced *prior* to any analysis determining whether the President's goal of an astrodome defense over the nation could be reached. The Fletcher Commission, set up to define the SDI program, was established *after* the President's "Star Wars" speech.

In my view, that nationally-televised speech of March 23, 1983 was one of the most irresponsible statements ever made by a U.S. President. Without consulting many of his key advisors, and in the absence of any scientific evidence, the President announced to the world that the United States could, through the development of exotic weapons technologies, protect itself from a Soviet missile attack. There was no basis for such a claim then, and there is no basis for such a claim today, five years later.

Had the President consulted with White House science counsel prior to his speech, he would have learned that the Administration's top scientists were deeply pessimistic about the prospects of developing a comprehensive missile defense, especially within the originally proposed timeframe. Mr. Reagan may have sincerely believed such a defense to be feasible, but in an area as important as national security and the risk of nuclear war, the nation simply cannot afford to let its fate be decided by pure political ideology and the

wishful thinking of one or two Americans. We have now spent some \$15 billion in pursuit of President Reagan's fantasy, yet even people such as former national security adviser Robert McFarlane now admit that the SDI pitch was misleading from the start.

Clearly, new links between technology and society must be built, and existing ones strengthened. New avenues for public involvement need to be created. But how much public involvement should there be? Can we assume that better decisions will necessarily result from increased public participation? Is the public equipped intellectually to make meaningful contributions to the decision-making process? On the downside, could public participating slow a decision about a new technological advancement to the extent that America loses its competitive position in the world market? And if so, should public participation be decreased or eliminated altogether on that basis?

Without pretending to have answers to these questions, I believe that, in general, the public will make reasonable decisions if they have the right information. I also believe that the public should be trusted to help make technological choices—to accept "good" technology and weed out "bad technology." After all, every advanced technology ultimately will have to meet the test of whether it helps human beings to achieve their long-term goals more effectively than some alternative technology, or no technology. Ordinary human beings, not scientists and engineers, will decide that question, through the marketplace, or through government intervention.

"It will benefit all of us if that question is answered early in the process of development of an advanced technology, not later, such as was the case for nuclear power. And it would be far better if each new development in science and technology were thoroughly analyzed, to the fullest extent possible, with its full range of potential impacts on society documented in great detail. In other words, the decision about advanced technology should be made, as in medicine, on the basis of *prior informed consent*."

Informed consent implies, however, that those being informed have the intellectual tools with which to make a rational decision based on the information they have been given. The first step in achieving informed consent, then, must be to improve science and mathematics education in the classroom.

Over the past 20 years, federal funding for university research facilities and equipment has declined by 95 percent in real terms. And, a recent federally-sponsored assessment

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*Presented at the Division of Professional Relations' symposium, "Advanced Technology and the Public Interest," held at the American Chemical Society national meeting, Los Angeles, September 26, 1988*

of education in the U.S. found the performance of American students in science to be "distressingly low"—only 7 percent of 17-year olds were found to be prepared adequately for college science courses. American students consistently score lower on international math and science tests than their counterparts in other industrial nations. Informed consent simply won't work in a society whose young people cannot perform simple mathematical operations. Teaching the importance of technology and its applications should be emphasized in the earliest grades, continuing through high school and college.

Second, we must remember that the sole purpose of new technology is to meet human needs, to improve the human condition. I am reminded here of what Albert Einstein said in 1931 at Caltech:

"It is not enough that you should understand about applied science in order that your work may increase man's blessings. Concern for man himself and his fate must always form the chief interest of all technical endeavors, concern for the great unsolved problems of the organization of labor and the distribution of goods—in order that the creations of our mind shall be a blessing and not a curse to mankind. Never forget this in the midst of your diagrams and equations."

What exactly does that mean in real terms? There must be a much stronger effort by the public, political leaders, and the scientific community to develop and refine long-term goals for a healthy and sustainable human society. There must also be methods developed for measuring new technologies against those long-term goals. In plainer terms, science has to make the connection to problems affecting human beings.

In the past, the science community has assumed a relatively passive role in answering questions asked by society as a whole, although this is beginning to change. As one historian put it, American scientists have generally preferred the laboratory bench to the soapbox. To speak out on public policy issues has been to invite ridicule from the scientific establishment.

Professor Sherry Rowland learned that lesson the hard way. As you may know, Dr. Rowland was the first American scientist to theorize that the stratospheric ozone layer was being damaged by chlorofluorocarbons, or CFCs. But he didn't confine his reports to technical journals. Instead, he warned reporters, Congress, local government officials—anyone who would listen. He thought, in 1974, the CFCs should be banned. Manu-

facturers and users of CFCs, as well as Rowland's peers, discredited the ozone depletion theory and criticized Rowland for becoming an advocate. Recent evidence confirming Rowland's hypothesis beyond a shadow of a doubt has helped to vindicate him, but how many scientists faced with similar situations learned from this example to refrain from speaking out?

If scientists don't speak out, debates and decisions regarding advanced technologies will be left solely to the lay public—and worse, to politicians—the overwhelming majority of which has little or no scientific training. We will have established an important link between technology and society when a concern for social and political issues infuses the science and engineering curriculum.

A third step toward achieving meaningful public involvement involves the communication of risks. Methods and processes for assessing and managing risks of new technologies must be continuously improved and effectively communicated to the public. Too often, perceived risk deviates significantly from actual risk. Poorly communicated risks can stir unneeded alarm, or create dangerous complacency to a problem. Unfortunately, news stories of the least scientific complexity are often misrepresented or simplified to the point of being inaccurate. Scientists and media reporters need to help each other to deliver the most accurate, understandable message as possible.

An interesting experiment in public information dissemination is now being conducted by the Environmental Protection Agency at the direction of Congress. Many of you are probably familiar with Title III of the Superfund Amendments and Reauthorization Act: the Emergency Planning and Community Right-to-Know Act of 1986. In response to public outcry following the Bhopal disaster in 1984, Congress began developing a mechanism to increase the public's knowledge and access to information about the presence of hazardous chemicals in their communities and releases of those chemicals into the environment. Under the law, facilities must annually submit lists of hazardous substances stored on the premises, and of chemicals emitted to the air. Local emergency planning committees are required to develop emergency response plans in the event of a release.

Critics of the new law claim it is a time-consuming and costly burden on industry, and that the information produced by the new reporting requirements are not in a form that is useful to the general public. For example, companies are not required to say whether annual emissions were released all at once, or spread out over time. Moreover, emissions

are reported in units of pounds per year, with no attempt at translation into possible atmospheric concentrations of the released substance. There is no doubt that the community right-to-know law goes a long way toward creating an informed and ready public. But we can already see that the requirements will have to be adjusted as we gain more experience with its implementation.

A similar law in the State of California, Proposition 65, has been the subject of public controversy in recent months. The Safe Drinking Water and Toxic Enforcement Act of 1986 requires warning before exposure to chemicals known by the State to cause cancer or reproductive toxic effects, and prohibits the discharge of these chemicals into drinking water sources. Again, critics charge that the public will receive confusing information and that it will unfairly place high costs of compliance on businesses. In fact, many of the new requirements are ambiguous, and raise questions that will ultimately be answered in the courts—the law has already spawned several court challenges. Still, Proposition 65 is a serious attempt at informing the public of the risks of exposure to harmful substances. If the overall level of public education is increased by these laws, they may be well worth their cost.

The costs of public involvement are by no means insignificant. Eliciting public response and incorporating societal values and needs into the decision-making process takes time. And time is money. Those of you who live on your ability to create and sell new products know that putting emerging technology to use as quickly as possible is essential to keeping pace in a volatile global economy. But nobody every said democracy was efficient.

It has been said that democracy will always come to the right decision, once it has exhausted every other alternative. Or more aptly stated, with all credit to Winston Churchill, "Democracy is the worst form of government, except for all others." If democracy is to remain meaningful as the world continues to become more complex and interconnected, and as the number of technological decisions affecting the average person continue to grow, then the possibilities for democratic involvement have to continue to be extended as well.

We face an immediate future rife with social, economic, political, environmental, and human problems. We have placed great faith in technology to solve many of those problems. But we must remember that science and technology only lead to policy when they are incorporated into a structure of human values and goals. I believe that our ability to build important links between society and its technologies is our key to future prosperity.

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## NOMINEES WANTED

Suggestions are being sought for potential recipients for next year's Henry Hill Award. Previous winners of this prestigious award, presented annually by the DPR in recognition of outstanding contributions in the area of professional relations, have included Alan Nixon, Gordon Nelson, Warren Niederhauser, Fred Owens, and the latest recipient, Bill Bailey. Name of nominee, along with a description of his or her accomplishments, should be sent to Dr. John S. Connolly, SERI, 1617 Cole Boulevard, Golden, Colorado 80401.

