Letters

The American Chemical Society: Fact and Fancy

The selection by the American Chemical Society (ACS) of Warren D. Niederhauser of the Rohm & Haas Company as president-elect for 1983 brings to a conclusion one of the most tempestuous elections in the 106-year history of the ACS. Although reports in the press (News and Comment, 29 Oct., p. 455; 3 Dec., p. 981) (*1*) described this election as a clash between the academic and the industrial segments of the Society, the facts show otherwise. The industrial executive had vigorous support from the academic community, while the university professor had support from many industrial colleagues. In no sense could the problems which arose during the campaign be described as an industrial-academic confrontation. The scientific community is currently under stress of various types. To generate false points of controversy within scientific ranks is certainly nonproductive. The election results are definitive. A determined Society is moving rapidly to attack the challenges which lie ahead.

The Society serves a broadly based membership, with concerns focusing on the problems of the very top corporate executives, practicing research chemists, college and university professors, teachers, patent specialists, marketing specialists, newly enrolled students, and many others. ACS programs reflect this diversity of a strongly committed membership. Society officers seek advice and help from the top leaders of the American chemical industry, from many committees and advisory bodies within the Society, from our Younger Chemists Committee, and from Student Affiliate groups. Programs to help unemployed and underemployed members are extensive. Further, such programs are under constant review to ensure that they do the best job possible with the resources available. A Committee on Economic Status monitors the economic health of the membership. A Committee on Science, involving some of the very top chemists of the world, is helping to keep ACS activities and policies in line with the important priorities of chemical science.

Our educational activities are exemplary. New efforts in education involve both the industrial and academic components of Society membership. Recently Corporation Associates, under the leadership of Hugo Stange of the FMC Corporation and Edel Wasserman of the du Pont Company, joined with the Society Committee on Science, chaired by Herbert Kaesz of the University of California at Los Angeles, to develop a program of support for America's schools. According to current plans, the high-level professional expertise, enthusiasm, and help of the industrial chemical community will be offered to schools to improve their precollege science education programs. A serious national problem is being attacked through the combined efforts of the industrial and academic members of the ACS.

The Society combines the diverse skills of many different members in rendering service to the nation and to the profession of chemistry around the world. All branches of science are touched. We have no time for industrial-academic feuds, and we regret that certain segments of the scientific press have misunderstood one of America's premier professional societies.

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Space Astronomy

In M. Mitchell Waldrop's article about the future of space astronomy (Research News, 10 Dec., p. 1101), he gives an account of possibilities for larger optical telescopes. In this context, he states that, by reducing the shuttle orbiter's internal payload, the very large External Tank (ET), which holds the shuttle's propellants, could be taken into orbit. Surprisingly, it appears that this could be done with a net *increase* in internal payload.

For safety reasons, NASA now dumps the ET into the Indian Ocean before the shuttle achieves orbit. NASA does not want a repeat of the Skylab incident of 1979. However, to put the ET into one particular empty stretch of ocean requires some loss of shuttle payload capability. The orbiter's trajectory must be adjusted to toss the ET back to Earth. At present, the main engines are shut down before achieving orbit. After the ET is discarded, the shuttle's Orbital Manuevering System must be used to move the spacecraft into its initial elliptical orbit.

A direct ascent into the initial orbit using the main engines could literally double the shuttle's payload. First, the internal payload could be increased by about a tonne. This comes from use of an optimal ascent trajectory and from the use of residual ET propellants. Second, the ET becomes 35 tonnes of "payload." Application of this payload to astronomy, as mentioned by Waldrop, is only one of a large range of possibilities.

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Laboratory Maintenance

The problem of laboratory maintenance is a part of the general instrumentation crisis in American universities, which may be as much a matter of inappropriate policies as insufficient funds. At the 1982 annual meeting of the Geological Society of America, a group of department chairpersons and other science administrators addressed this problem and, although no miracle cures were offered, suggestions were made that are worth repeating.

All maintenance costs and the responsibility for covering them for a specific time should be clearly defined before instruments are acquired. Minimum levels of technical staffing and material support should be mandated, as should minimum user fees; and these levels should be indexed to economic parameters. Most equipment grants include a statement that obligates the institution to provide adequate care for the equipment, but because most instruments (at least initially) serve specific projects and identifiable user groups, the costs of maintenance are treated as direct costs to grants or contracts. There is, typically, no provision in the institution's indirect cost base to maintain such instruments or laboratories during extended periods of inadequate external funding. Here policy might be improved: in addition to broadening the indirect cost base, it was suggested that cost-sharing formulas should favor maintenance commitments over acquisition costs.

Technical understanding should be required of users. For a variety of reasons, from raising performance standards to reducing casual maintenance costs, it is wise to limit access to users who have completed a course (formal or not) in instrumental methods and maintenance.

Responsibility for an instrument should be assigned to an individual with an active, vital interest in its performance. Committees or uninterested individuals make poor custodians.

Department chairpersons, and others, should consider alternative facilities before attempting to establish any in-house laboratory. There are many accessible instruments on campus and off. One way to encourage their use is to hold an annual, campus-wide or wider, instrument fair or awareness course, in which prospective users and laboratory directors get together.

The group also made some specific tips: limit the number of manufacturers so as to cut down on the number of test instruments, spare parts, and service calls; protect instruments from power and other system failures; and follow a regular schedule for parts replacement and servicing.

Laboratory maintenance is not a glamorous or exciting subject, but its importance is hard to overstate. The fact is that, for the remainder of our professional lives, we are going to take better care of our laboratories, or many of us will do without.

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Cotton Dust Standard

Hans Weill states in his letter of 5 November (p. 518) that his 1977 testimony at the Occupational Safety and Health Administration (OSHA) hearing on its then proposed cotton dust standard "supported the 1978 [OSHA] cotton dust standard." In fact, Weill's testimony in 1977 did not support the 200 micrograms (μg) per cubic meter (m^3) standard adopted by OSHA the following year. Indeed, his interpretation of the data collected at three cotton mills for the industry-funded study gave support to those who found the OSHA standard excessively stringent. Weill reported finding a "mill effect," which he characterized as "an important confounding variable in prevalence studies" (*1*, p. 3). He stated that, when the exposure and health effects data were analyzed separately for each mill, he "could not demonstrate an effect of current dust exposure beyond the mill effect" (*1*, p. 2). This was in sharp contrast to the highly reliable linear dose-response relationship found by Merchant *et al.* (*2*), which served as the basis for the exposure limit chosen by OSHA.

At the request of the Amalgamated Clothing and Textile Workers Union, John Peters of the Harvard School of Public Health (*3*) reviewed the raw data collected by Weill and evaluated Weill's conclusions. Peters found that there were several factors in the study which made "drawing conclusions by comparing mills highly questionable." He noted that Weill's choice of three exposure categories served to mask the effect of very high exposures occurring in one plant. Peters demonstrated that the addition of a fourth gradient of exposure to the analysis "could explain the so-called mill effect . . . [and] confirm the data generated by others that cotton dust at levels of 0.2 mg/m^3 and greater produces health effects that should be prevented" (*3*).

Weill testified in 1977 that a "level of cotton dust exposure which carries an acceptably low risk of byssinosis will fall between 200 μg and 500 μg per cubic meter" (*1*, p. 2). This was consistent with the industry's position in favor of a 500 μg/m^3 limit. According to Merchant's dose-response curve (*2*), this would have doubled the risk from 12.7 percent at 200 μg to 26 percent at 500 μg.

Weill also states in his letter that his finding of a "mill effect" has been "widely accepted." Yet OSHA, in adopting the 200-μg limit in 1978, rejected the "mill effect" and adopted Peters' supplemental analysis of the raw data as indicating a correlation between exposure and adverse health effects.

In their 3 December letter (p. 951), S. P. Hersh and R. E. Fornes of North Carolina State University (NCSU) also describe themselves as unbiased members of the National Academy of Sciences (NAS) panel. Notwithstanding the issue of financial support, Hersh in fact testified (*5*) for the textile industry at the 1977 OSHA hearing supporting a dust limit (in weaving) of 900 to 1200 μg/m^3, consistent with the industry's choice of 100 μg/m^3. A 1200 μg/m^3 limit would produce a byssinosis prevalence rate of 14.6 percent, according to Merchant (*2*), or more than double the rate produced at the dust limit eventually chosen by OSHA (less than 7 percent). When interviewed, I referred to this testimony but was only quoted regarding issues of financial support. Taken out of context, this latter quote implied a general criticism of NCSU that is certainly not appropriate. On the contrary, various members of the NCSU faculty have made substantial contributions toward the solution to occupational hazards in the textile industry, for which textile workers are grateful.

On the larger issue of the NAS panel's conclusion that the link between dust exposure and chronic lung disease is yet to be confirmed, I believe the panel misinterpreted a number of studies demonstrating the chronic effects of exposure to cotton dust. The panel dismissed the work of Bouhuys and his co-workers Beck and Schachter, whose studies showing the progressive loss of lung function among retired cotton textile workers were brought to the panel's attention. These results have once again been reported (*6*) and were characterized in an editorial by Epler as "contributing valuable information for the kind of precise definition of occupational lung diseases needed by clinicians and administrative agencies" (*7*). It is not surprising, therefore, that the NAS report's conclusions were rejected not only by panel member Kilburn (in his minority report), and by Merchant, Schilling, Beck, Schachter, and Wegman [as reported by Marjorie Sun (News and Comment, 24 Sept. 1982, p. 1232)], but also, according to Frank Press' introductory letter, by "some of the reviewers of the report" with whom the "authoring Committee [was] not able to resolve completely their differences of opinion."

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