Letters

NIH Misconduct Procedures: Effect of New Ruling

The News & Comment article by David P. Hamilton concerning the decision in Abbs *vs.* Sullivan *et al.* (11 Jan., p. 153) presents an inaccurate picture of the facts and possible implications of the judge's ruling in this case. Hamilton correctly notes that the judge's ruling in Abbs *vs.* Sullivan *et al.* applies only in the Western District of Wisconsin, yet he goes on to make overgeneralized predictions about the potential impact of the ruling for operations of the National Institutes of Health Office of Scientific Integrity (OSI).

We are studying carefully the judge's ruling to determine the proper course of action with which to preserve our ability to fulfill our important responsibilities to protect the public interest. Meanwhile, the activities of the OSI are far from being in disarray, as Hamilton suggests. There is no reason for the OSI to "suspend" ongoing inquiries and investigations, and we have no plans to do so. Moreover, since the judge's ruling found that the Public Health Service (PHS) procedures provide adequate due process, any substantive changes in the procedures would be within the discretion of the Department of Health and Human Services, even if the policies and procedures are eventually subjected to public notice and comment.

What is *most* significant about the court's ruling is its affirmation of the policies and procedures by which the OSI handles inquiries and investigations. Specifically, the court found that (i) neither James Abbs nor the co-plaintiffs, the University of Wisconsin Board of Regents, "has a legally cognizable liberty or property interest that implicates the due process clause"; (ii) adequate procedures exist for protecting the interests of Abbs and the Board of Regents, both with respect to "lesser sanctions" that may be imposed by the PHS and with respect to the most severe sanction that may be imposed—debarment from receiving federal grant and contract support; therefore, there is adequate due process in the PHS policies and procedures; and (iii) the doctrine of administrative res judicata does not bar the OSI from investigating possible scientific misconduct on the part of Abbs.

The court's opinion also made other observations important to the PHS mission. In particular, the judge found that Abbs has no enforceable right to receive grants or awards—"such funding is always discretionary with the funding agency." Moreover, the judge noted that grant awards to the University Board of Regents are not made for the benefit of Abbs, "but for the benefit of the public that may enjoy the fruits of his research." These are compelling affirmations of the fundamental purpose of the Public Health Service research grant program to serve the public interest.

The issues raised in Abbs. *vs.* Sullivan *et al.* are vital ones. The OSI is proceeding with its assigned responsibilities while the implications of the court's ruling are assessed.

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Energy Conservation

Jeremy Cherfas' recent News & Comment article "Skeptics and visionaries examine energy saving" (11 Jan., p. 154) considers only the lighting benefits of new, high-efficiency light sources. The article refers to replacing a 75-watt conventional incandescent light bulb with a modern 15-watt fluorescent tube and states that one can "cut your lighting bill by 80% to 90%. . . ." However, very few electricity users ever see a utility bill for lighting only. Also, the energy consumed by a light bulb includes a significant component in the form of heat. Finally, the lighting component ultimately degrades to heat, so it is naïve to view the energy cost of a light source without regard to the concomitant heat source it generates. It is well known that large, modern office buildings receive a significant contribution to their heating plant from the waste heat from lighting systems. Therefore, the impact of substituting a high-efficiency light bulb for one of lower efficiency is not as simple as conservation advocates say it is (even ignoring the unlikely ability of the fluorescent tube to match the generally preferred optical properties of incandescent bulbs). In the heating season, the lost heat source must be made up elsewhere by the heating plant. If electrical heating is used, there will be no net savings. Conversely, during air-conditioning season, the reduced heat load will have an enhanced benefit from saving additional energy otherwise needed for cooling.

In order to predict the savings (if any) to be realized by switching to new, high-efficiency light bulbs, the consumer needs to know the facts concerning both lighting and heating aspects of the alternatives.

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If, at the Dahlem Workshop, Amory Lovins "is willing to concede half" of his projected energy savings, it means at least two things.

1) He can no longer talk about "saving 75% of the energy we use," and no credible publication should carry such claims from now on.

2) Now even Lovins' projections show that we will need more power plants. W will need them in this decade, which means that we should be designing them now and starting environmental studies for their sites. In fact, the tremendous capital requirements and the decades to achieve the actual results of the measures Lovins describes make even half of the 75% savings an impossible goal, regardless of how valuable it would be to reach it.

Until there is confidence that conservation measures will actually achieve the penetration into the marketplace to defer (not eliminate) additional capacity, we should be building new plants. The problem facing the United States now is that it has become "politically correct" for state public utility commissions to approve expenditures for conservation and charge the ratepayer for them, perhaps years before they pass the traditional "used and useful" test. At the same time, investments in generating facilities face years of contentious hearings, and even then there is no firm assurance that adequate rates will be allowed when they are finished.

Those with responsibilities to the public for energy supply have listened to the words about providing energy services. But they know that their obligation to the territory they serve is to ensure that there is enough electric generating and distribution capacity to allow people to make their own free choices as to what they want and how to do it. We're running out of capacity as insurance against future shortages, and the costs, both to the ratepayer and to the environment, will be high in gas turbines and other inefficient catch-up fixes.

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Cherfas's welcome and stimulating account of the Dahlem Conference described our findings slightly inaccurately.

1) The ~0.6¢ cost of saving a kilowatt-

hour is for a package of reflectors, lamps, ballasts, and controls applied to *tubular*-fluorescent lighting, not for replacing incandescent with compact fluorescent lamps.

2) The five new insulation materials for refrigerators and the like are not "hundreds of times" but only about two to ten times as efficient as freon-filled foam.

3) We would never say or think that failure to capture 100% of efficiency's technical potential "shows how irrational consumers are." Consumers are canny and sensible, but lack sound information and convenient access to the best packages of modern technologies. They are served by utilities that are often misguided by perverse regulation and (as Cherfas rightly says) price electricity with a discount rate tenfold lower than customers apply to efficiency, thus diluting price signals tenfold. Like other practitioners' work, our work emphasizes proven, practical ways to correct such market failures, not blaming their victims.

4) We analyze "maximum technical potential" savings for the same reason mineral economists analyze reserves (identified resources profitably producible with present technology): as a basis, not a substitute, for production plans. Although reserves are never actually 100% produced, some utilities have shown that *most* of the potential in particular efficiency "micromarkets" can be quickly and cost-effectively captured (*1*) at empirical costs consistent with our calculations.

5) Potential savings from 35 improvements to motor *systems* (not just motors) might be as high as "nearly 60%," but we claim, and colleagues at the Electric Power Research Institute (EPRI) concur with (*2*, p. 68), only a 50% potential with about a 16-month payback—still enough to save more than a fourth of the world's electricity.

Our detailed engineering-economic analyses of electric efficiency potential, documented from measured cost and performance data, are so far unrebutted and their acceptance is growing. Differences remain—EPRI's supply curve shows potential savings that are several times smaller and costlier than ours (*2, 4*)—but the difference is mainly methodological, not substantive, and is less important than our consensus that the cost-effective potential is many times what utilities now plan to capture.

The latest data are strongly supportive: for example, on 14 January, five engineering firms competing to retrofit a 1900-square-meter part of Pacific Gas & Electric's research office submitted conceptual designs (*5*) with calculated cost-effective savings of 67 to 87% using commercially available technologies. One design was calculated to save 85% of electricity (with greatly improved esthetics, comfort, and productivity) at an average cost of about 2.1¢ per kilowatt-hour, about a 3-year payback. Fine-tuning now under way should do even better.

There is a similarly striking potential to save oil: in the United States, about 80% at a few dollars per barrel (*6*). The most important step would be "feebates"—revenue-neutral, sliding-scale fees for inefficient, and rebates for efficient, new cars (7).

In practice, energy efficiency won't *all* be done, or done right. But its potential appears larger than is needed, with chlorofluorocarbon substitution and sustainable farming and forestry practices, to stabilize the earth's climate at negative social internal cost (*8*).

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REFERENCES

1. For example, New England Electric System captured 90% of a 200-customer commercial retrofit pilot in 2 months; Pacific Gas and Electric captured 25% of new commercial construction in 3 months and its entire 1991 new commercial target in 9 days; in the residential sector, several Iowa municipal utilities have installed air-conditioner controllers, and the Hood River Project in Oregon retrofitted

superinsulation, in more than 90% of eligible homes in 1 to 2 years.

2. A. P. Fickett, C. W. Gellings, A. B. Lovins, *Sci. Am.* **262**, 64 (September 1990).
3. COMPETITEK Hardware Reports (Rocky Mountain Institute, Snowmass, CO, 1988–1991).
4. EPRI's curve is for potential savings achievable by the year 2000, while Rocky Mountain Institute's (RMI's) is long-term asymptotic. EPRI's excludes, but RMI's includes, a further 9 to 15% savings that EPRI believes will occur spontaneously by 2000. EPRI's curve is near the lower end of a 20-percentage-point range of uncertainty [E. Hirst, *Possible Effects of Electric-Utility DSM, 1990 to 2010* (ORNL/CON-312, Oak Ridge National Laboratory, Oak Ridge, TN, 1991), p. 21, figure 12]. EPRI's excludes, but RMI's includes, credit for maintenance costs saved by customers. And EPRI's drivepower savings are about three times smaller and about five times costlier than is agreed in (*2*, p. 68).
5. Information on this "ACT^2" project is available from Pacific Gas & Electric's Research and Development Department, 3400 Crow Canyon Road, San Ramon CA 94583, 415-866-5330. The cost-effectiveness limit used a utility perspective—9¢ per kilowatt-hour, levelized over 30 years at a 6½% per year real discount rate. Several designs were projected to cost far less.
6. A. B. Lovins and L. H. Lovins, *New York Times*, 3 December 1990, p. A15; documented in _____, *The World Petroleum Market in the 1990s*, R. Reed and F. Fesharaki, Eds. (Westview, Boulder, CO, 1989); supply curve in (*8*).
7. The California Legislature passed such a "Drive+" measure by a 7 to 1 margin in August 1990. It was vetoed, but the new governor is expected to sign a repassed version later this year. "Feebates" could also be applied to heavy transport, buildings, appliances, and so forth and could encourage early scrappage of inefficient stocks.
8. A. B. Lovins and L. H. Lovins, "Least-cost climatic stabilization" (Rocky Mountain Institute, Snowmass, CO, 15 October 1990).

Ribozyme Technology Patents

Ann Gibbons, in her article "Molecular scissors: RNA enzymes go commercial" (Research News, 1 Feb., p. 521), refers to Innovir Laboratories having purchased "licensing rights" to a ribozyme technology from Sidney Altman. I would like to clarify that it is Yale University that has filed applications for patents on ribozyme technology on behalf of Altman and his colleagues. This technology is not dominated by Thomas Cech's patent. Yale, in turn, has licensed rights to Altman's technology to Innovir, a company whose purpose is to develop ribozymes as antiviral therapeutics and which has applications for patents pending on its own distinct ribozyme technology.

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Venus Lightning

In his Research News article "Catching Venus in the act" (17 Aug., p. 742), Richard A. Kerr commented on the connection between Venus lightning and active volcanoes. Kerr further clarified the credibility of this connection in his response to the letter "Venus phenomena" by Paul A. Cloutier (12 Oct., p. 191). The physics of lightning in Earth's atmosphere is a complex phenomenon and is not well understood. However, it is established that terrestrial lightning is a global phenomenon, and the frequency of lightning occurrence is known to increase with the injection of volcano plumes in the terrestrial atmosphere. These facts led Fred Scarf and Chris Russell, who analyzed the electric field detectors data aboard the Pioneer Venus Orbiter (PVO), to suggest topographical clustering of orbiter electric field detector (OEFD) signals over volcanic highlands on Venus (*1*).

Cloutier, in his letter, makes the statement (without justification) that, "In 1986 Russell working with R. N. Singh changed the definition of Venus lightning" (*2*). Lightning is produced by electrical discharges from clouds to a planet's surface or between clouds; it has a broadband frequency distribution, with a well-defined amplitude peaking at a certain frequency and falling amplitudes at lower and higher frequencies. Signals not conforming to such an amplitude distribution are generally not attributed to lightning. Harry Taylor and Cloutier attributed these signals to telemetry interfer-