LETTERS

Degrees Revoked in Soviet Union

A fundamental principle of academic freedom accepted throughout the world is the sanctity of academic degrees. Once earned and granted in recognition of the scholarly achievement of individuals, they are irrevocable. That principle is now being grossly violated as the Soviet Union accelerates its persecution of emigration and human rights activists by revoking their advanced degrees. According to the Los Angeles *Times* (*1*), 65 scientists "have lost or are in the process of losing their academic degrees since this practice began occurring systematically about a year ago. . . ."

The Soviet Higher Attestation Commission's (VAK) letter of 3 December to Dr. Leonid D. Stonov, in one brief paragraph, negates his years of study and research:

To: L. D. Stonov

The VAK of the USSR informs you that following the request of the Scientific-Technical Council at the All-Union Research Institute on Chemical Means of Plant Protection addressed to the VAK of the USSR on the 28th of January 1981 (Protocol No. 6–1), it deprives you of the academic degree of Candidate of Agricultural Sciences and the academic title of senior scientific worker. The diploma of the Candidate of Agricultural Sciences No. MSKh 003289 and the certificate of senior scientific worker No. MSN 027299 are declared to be invalid and should be returned to the offices of the VAK of the USSR at the following address: Moscow, No. 12, Griboyedova St.

Deputy Chief Academic Secretary,
(Signed) V. V. Davydov

It is no coincidence that all those who received similar letters are either Jewish and/or have applied to emigrate. And it is frightening to recall that the revocation of all degrees earned by Jews in Nazi Germany foreshadowed more intense persecutions. We believe that, if unchecked, the Soviet revocation of advanced degrees will become an increasingly popular weapon against any scholars who are considered politically unreliable.

We abhor this practice as a gross violation of human rights and academic integrity. Moreover, we are distressed over the human toll it exacts: scientists stripped of degrees are subject to cuts in salary, demotion, humiliation, and ostracism by academic peers; denial of access to scientific libraries and laboratories; and even dismissal from professional employment.

We call upon all scientists and academics to voice their opposition to this reprehensible practice which, although reported last August (*2*), has yet to be widely denounced by the international scientific community. Given their commitment to scientific progress and academic integrity, professional societies should be in the forefront condemning the use of academics as a tool of persecution. As conferers of degrees, universities should respond by declaring that they will recognize degrees unjustly and immorally revoked.

If these earned degrees are not returned to the individuals concerned, and if the practice of revocation continues, we believe the U.S.S.R. will have placed itself outside the pale of civilized countries and will deserve to be treated as such.

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References

1. R. Gillette, Los Angeles *Times*, 24 February 1982, p. 10.
2. D. Hirsch, *Nature (London)* **292**, 578 (1981); V. Rich, *ibid.*, p. 789.

Society for Scientific Exploration

There are a number of topics about which the public turns to scientists for information, only to find that the scientists have little information or interest. Some of these phenomena are outside the mainstream of science because their purported properties appear to run counter to established scientific knowledge. For instance, "precognition" violates the principle of causality, and "UFO reports" sometimes describe phenomena that apparently violate laws of motion. Since the relevant evidence is "soft" (typically narrative), there is good reason for scientists to be skeptical of the reality of these phenomena.

A number of other topics potentially investigable by scientific methods do not belong to any recognized subdiscipline of science, and for this or other reasons tend not to be fully discussed in the scientific literature. Examples include suspected but implausible cross-disciplinary relationships, rare catastrophes, and topics (such as "SETI") which may involve unknown intelligence.

The established disciplines and operations of science and other forms of scholarship do not always offer a ready procedure by which concerned scientists and scholars may investigate anomalous phenomena in response to the public (or their own) interest. Exchange through refereed articles in established journals is essential for scientific and scholarly work, but such journals are often reluctant to give space to these topics.

We see little prospect of arriving at an assessment of such phenomena (beginning with their reality) until they are subject to the normal processes of open publication, debate, and criticism. This conviction has led to the formation of the Society for Scientific Exploration, Formed for the Study of Anomalous Phenomena, which I currently serve as president. The society will provide a forum by which research on these and related topics may be presented to other members of the society and to the scientific and scholarly community in general.

The society has no intention of endorsing the reality or significance of any particular topic. On the other hand, no subject will be prohibited from discussion or publication simply because it is not now an accepted part of scientific or scholarly knowledge. We anticipate that most members will take the point of view that any purported anomalous phenomenon is unlikely to be real, but honest evidence concerning any of them deserves open investigation without prejudice.

Membership in the society is open to interested persons who have an established ability in science as demonstrated by the award of a Ph.D., the publication of scholarly or scientific articles, or equivalent evidence. The society's first meeting, open to members and their registered guests, is to be held from 2 to 4 June 1982 at the Center of Adult Education, University of Maryland. Further information concerning the society may be obtained from Laurence W. Fredrick (Secretary), Department of Astronomy, University of Virginia, Post Office Box 3818, Charlottesville 22903.

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Diesel Emissions and Health

The rapid price increase in hydrocarbon fuel has resulted in a significant shift to the use of more fuel-efficient vehicles, including those equipped with diesel engines. Current projections indicate that

25 percent or more of the light-duty vehicles may be powered by diesels by 1990. The improved fuel efficiency of diesel engines is accompanied by a significantly higher rate of particulate emission. Thus, based on current performance, one conservative estimate (*1*) projects 155,000 metric tons of particulates in the United States alone annually by the end of the decade from light-duty diesel vehicles and the total particulate load, including that from heavy-duty diesels, may be more than twice that.

Examination (*2–5*) of the organic extracts of diesel particulate matter indicates significant activity in short-term mutagenicity assays that might be indicative of a *potential* of these materials to induce cancer 20 to 30 years later. Increasingly convincing evidence (*3–8*) for the presence of a class of chemicals called nitroarenes in diesel effluent has been obtained during the last 2 to 3 years. Various groups have reported (*4–5, 7*) that 1-nitropyrene accounts for about 20 percent of the total mutagenicity of diesel effluents. In addition, several investigators have recently detected and reported (*4, 6, 9*) dinitropyrenes as well in diesel particulates. Their contribution to the activity might account for an additional 30 to 80 percent of the total activity. One of these compounds, 1,8-dinitropyrene, is the most potent mutagen reported to date. Thus, it is probable that nitroarenes represent the major class of mutagens in diesel particulates. It can be estimated that the yearly emission in the United States of 1-nitropyrene alone by light-duty diesel engines will be 14,500 kilograms by 1990.

The above observations lead directly to what can be considered the two critical questions:

1) Does inhalation of diesel particulates result in adverse health effects? Specifically, are the results of mutagenicity assays indicative of risks to the environment and humans?

2) Are nitroarenes in general an essential result of the combustion process or do they arise as secondary by-products from the simultaneous presence in the exhaust of polycyclic aromatic hydrocarbons, oxides of nitrogen, and acids? If indeed nitroarenes represent only a small fraction of the mass (approximately 2 percent) yet a major portion of the biological activity of diesel effluents, this provides a unique opportunity for controlling and reducing their concentration. Could optimization of the combustion process or modification of the afterburn result in the control and reduction of nitroarene formation without other adverse consequences?

Since a definitive resolution of the biological consequences of nitroarenes is not likely to be available soon, attempts to minimize their formation in diesel particulates through modification of the combustion process appear to be justified; various afterburn treatments appear promising in this respect. Exposure to mutagenic nitroarenes is not restricted to humans. Because of their widespread distribution, they have the potential of acting on and inducing genetic modifications in the flora and fauna, including the highly inbred and therefore vulnerable food-producing plants, such as corn and wheat.

The widespread distribution, potent mutagenicity, and uncertain biological effects of nitroarenes on higher forms of life indicate there is a need for prompt investigation and caution. This does not appear to be the time to dismiss emissions as a potential health risk and relax the relevant levels of permissible effluents. Nor does it seem wise, as presently contemplated, to curtail federally funded programs to investigate the health effects of diesel emissions. Finally, because it has been found that particulate matter and mutagenic emissions are increased even more drastically in malfunctioning diesel engines, it would appear prudent to alert the public to the importance of a properly adjusted engine and to include appropriate mandatory checks in state vehicular inspection programs.

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References

1. M. N. Ingalls and R. L. Bradow, *Air Pollut. Control Assoc. Abstr. 74th Annu. Meet. 81-56.2* (1981).
2. L. D. Claxton and H. M. Barnes, *Mutat. Res.* **88**, 255 (1981); Y. K. Ohnishi, K. Kachi, K. Sato, I. Tahara, H. Takeyoshi, H. Tokiwa, *ibid.* **77**, 299 (1980).
3. G. Löfroth, in *Applications of Short-Term Bioassays in the Analysis of Complex Mixtures*, M. D. Waters, S. S. Sandhu, J. L. Huisingh, L. Claxton, S. Nesnow, Eds. (Plenum, New York, 1981), pp. 319–336; Health Effect Panel, Diesel Impact Study Committee, *Health Effects of Exposure to Diesel Exhaust* (National Research Council–National Academy of Sciences, Washington, D.C., 1981); S. M. Rappaport, Y. Y. Wang, E. T. Wei, R. Sawyer, B. E. Watkins, H. Rapoport, *Environ. Sci. Technol.* **14**, 1505 (1980); D. Schuetzle, T. D. Riley, T. J. Prater, T. M. Harvey, D. F. Hunt, *28th Congr. Int. Union Pure Appl. Chem. Abstr. AN-11* (1981).
4. T. C. Pederson and J. C. Siak, *J. Appl. Toxicol.* **1**, 54 (1981); abstract of paper presented at the Environmental Protection Agency Diesel Emissions Symposium, Raleigh, N.C., 1981.
5. J. N. Pitts, Jr., D. M. Lokensgard, W. Harger, T. S. Fisher, V. Majia, J. J. Schuler, G. M. Scozziell, Y. A. Katzenstein, *Mutat. Res.* **103** (1982).
6. J. Campbell, G. C. Crumplin, J. V. Garner, R. C. Garner, C. N. Martin, A. Rutter, *Carcinogenesis* **2**, 559 (1981); T. R. Henderson, J. D. Sun, R. E. Royer, C. R. Clark, T. M. Harvey, D. F. Hunt, J. E. Fulford, A. M. Lovett, W. R. Davidson, abstract of paper presented at the Environmental Protection Agency Diesel Emissions Symposium, Raleigh, N.C., 1981; M. G. Nishioka, B. A. Petersen, J. Lewtas, *ibid.*
7. I. Salmeen, A. M. Durisin, T. J. Prater, T. Riley, D. Schuetzle, abstract of paper presented at the Environmental Protection Agency Diesel Emissions Symposium, Raleigh, N.C., 1981.
8. M. D. Erickson, D. L. Newton, M. C. Saylor, K. B. Tomer, E. D. Pellizzari, R. B. Zweidinger, S. Tejada, *ibid.*; X. B. Xu, J. P. Nachtman, Z. L. Jin, E. T. Wei, S. Rappaport, A. L. Burlingame, *ibid.*; J. A. Yergey, T. H. Risby, S. S. Lestz, *ibid.*; R. B. Zweidinger, *ibid.*
9. B. A. Petersen, C. C. Chuang, W. L. Margard, D. A. Trayser, *Air Pollut. Control Assoc. Abstr. 74th Annu. Meet. 81-56.1* (1981); *28th Congr. Int. Union Pure Appl. Chem. Abstr. AN14* (1981).

Leprosy Vaccine

In Thomas H. Maugh II's excellent article on the leprosy vaccine feasibility studies (Research News, 26 Feb., p. 1083), there is no mention of the crucial role of the National Institute of Allergy and Infectious Diseases (NIAID) of the National Institutes of Health in sponsoring basic and applied research on leprosy. Through both grants and contracts, NIAID funds research on propagating the causative agent in vitro, growing it in armadillos, separating it from infected armadillo tissue, and isolating and characterizing protein and lipid antigens from the purified agent. The NIAID also funds studies on the epidemiology, immunology, and serology of leprosy and coordinates the exchange of materials, such as *Mycobacterium leprae* itself, purified antigens, serum samples from leprosy patients, and polyclonal and monoclonal antibodies. In addition, NIAID administers the U.S.–Japan Cooperative Medical Science Program, wherein scientists from the United States and Japan meet annually to discuss research and progress in several tropical diseases, one of which is leprosy.

According to Darrell Gwinn, Leprosy Program Officer at NIAID, almost $1.5 million is being spent annually on leprosy-related programs. Many of these efforts concern the individual's immunological response to the leprosy bacillus and therefore are directly related to the development of a leprosy vaccine.

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Erratum: In the report "Long-term synaptic potentiation in the superior cervical ganglion" by T. H. Brown and D. A. McAfee (12 March, p. 1411), equation 2 and the following lines should read:

$$I(t) = P\exp(-t/\tau_P) + L\exp(-t/\tau_L)$$

where $P\exp(-t/\tau_P)$ is the early, rapidly decaying component and $L\exp(-t/\tau_L)$ is the slowly decaying, long-term component.