Letters

Animal Rights Literature

The letter of John Hoyt, president of the Humane Society of the United States (17 Mar., p. 1419), requires a response. He states, "The HSUS is not an antivivisection society." Yet in their 1988 Holiday Appeal (*1*), signed by Hoyt, we find the following statements: "Not only have we continued to work to abolish the cruel psychological experimental research . . . , but we have also prodded commercial and government-funded laboratories to *eliminate altogether the use of animals as research subjects*" (emphasis added). In his letter to *Science*, Hoyt writes, "[W]e object to characterization of animal activists as anti-science, anti-intellectual, and anti-rational." Although such labels undoubtedly do not apply to all animal rightists, comments by some of the leading figures in the movement and statements in the literature of major animal rights organizations indicate that these labels are indeed appropriate for some members of that camp.

One of the more common assertions is the description of some research projects as "bizarre and of no practical value." Programs are frequently criticized as having no relation to human health problems, and some supposedly "moderate" animal rights advocates would allow research only if it can be shown to be directly helpful to humans. For example, Neal Barnard (*2*) is credited with stating, at a recent symposium on our campus, that it is pointless to use animals for AIDS research because the disease is peculiar to human beings. He is further quoted as saying, "There is no good animal model for AIDS. There are monkeys which have a disease similar to AIDS but it is caused by a different virus" (*3*). But as Robert Leader and Dennis Stark point out in their excellent review (*4*),

> There has probably been more rapid progress in knowledge of AIDS over the past 5 years than of any other very difficult medical conundrum in history. Much of this progress has been due to understanding and cooperation between those studying a purely human disease and conditions afflicting animals.

We could cite numerous other examples of anti-scientific and anti-intellectual statements by leading figures in the animal rights movement. Clearly, many choose to ignore the fact that virtually every advance in the biomedical field has depended ultimately on basic research (*5*), much of it using animals, and some of which is characterized as bizarre by animal rightists.

Perhaps most insidious are the written distortions of medical history in the anti-vivisectionist literature. For example, in a slick, pseudoscientific booklet published by the American Anti-Vivisection Society, we learn from Brandon Reines (*6*) that William Harvey did not need animals [contrary to Harvey's own words (*7*)] to deduce the functions of the circulatory system. Instead he made do with cadaver hearts and his own arm. We also learn, in a section devoted to showing us that animals were not necessary for developing immunosuppressive drugs, that "the ability of corticosteroids to kill white blood cells was known from studies of actual human patients as long ago as 1855" (*6*, p. 55), a "fact" that would have astonished Addison (*8*). In another publication (*9*), Reines tells us that Banting and Best need not have used dogs in the research that led to the discovery of insulin. Isn't hindsight wonderful? Throughout these tracts and others like them [particularly the writings of Hans Ruesch (*10*)] we are told over and over that everything we know about biomedicine has come from clinical observations and that animal experimentation has actually held back progress in finding cures and treatments for human diseases. Unfortunately, some people believe these fairy tales.

Another example of irrational rhetoric from the animal rightists is the equating of killing broiler chickens in slaughterhouses to the Holocaust perpetrated by the Nazis (*11*). They also analogize the Emancipation Proclamation, the civil rights movement, and efforts to win equal rights for women with the "liberation" of turkeys from poultry farms or of rabbits from research laboratories. We find such statements to be repugnant. They are racist, sexist, and misanthropic.

In view of the record, we would have found Hoyt's expression of umbrage more convincing if he had disavowed such statements, which are made all too frequently by his compatriots.

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REFERENCES AND NOTES

1. "Holiday appeal" (Humane Society of the United States, Washington, DC, 1988).
2. Neal Barnard is Assistant Clinical Professor of Psychiatry and Behavioral Sciences at George Washington University, Washington, DC, and chairman of the Physicians' Committee for Responsible Medicine.
3. *Daily Californian*, 9 February 1989. Copies of this article are available to interested readers who send us a stamped, self-addressed envelope.
4. R. W. Leader and D. Stark, *Perspect. Biol. Med.* **30**, 470 (1987).
5. J. H. Comroe, *Exploring the Heart* (Norton, New York, 1983).
6. B. Reines, *Heart Research on Animals* (American Anti-Vivisection Society, Jenkintown, PA, 1985), p. 44.
7. W. Harvey, *An Anatomical Disquisition on the Motion of the Heart and Blood in Animals*, translated from the Latin by Robert Willis (Dent, London, 1907).
8. T. Addison, *On the Constitutional and Local Effects of Disease of the Suprarenal Capsules* (Highley, London, 1855).
9. B. Reines, *The Truth Behind the Discovery of Insulin* (American Anti-Vivisection Society, Jenkintown, PA, undated).
10. H. Ruesch, *Slaughter of the Innocent* (Civitas, Klosters, Switzerland, 1985).
11. C. Brown, Washington *Post*, 13 November 1983, p. B1.

Office of Scientific Integrity

In her News & Comment article "Fraud review may be taken from NIH" (24 Mar., p. 1545), Barbara J. Culliton refers to "a proposal" to create two new offices in the Department of Health and Human Services (DHHS) for dealing with scientific misconduct. In fact, the Public Health Service (PHS) has already made the decision to establish these offices. The 16 March 1989 *Federal Register* notice referred to in Culliton's article was published as part of DHHS standard procedure for announcing changes within its organization.

Over the last year, the Office of the Assistant Secretary for Health, the National Institutes of Health (NIH), and the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA) have consulted with the research community on how to improve our system for dealing with scientific misconduct. As a result, the PHS decided that the establishment of two offices—complementary but not overlapping—would strengthen our oversight and investigative functions in detecting and preventing scientific misconduct. Any allegations or suspicions of misconduct in biomedical or behavioral research, research training, and related activities supported with funds authorized by the PHS Act will be handled by these offices.

The Office of Scientific Integrity (OSI) will be housed in the Office of the Director, NIH, and will be jointly administered by NIH and ADAMHA. The OSI will see that all PHS policies and procedures related to scientific misconduct are implemented; it will monitor the individual investigations into scientific misconduct conducted by institutions that receive PHS funds for biomedical or behavioral research; and it will conduct its own investigations.

The Office of Scientific Integrity Review (OSIR), in the Office of the Assistant Secretary for Health, will establish overall PHS policies and procedures for dealing with misconduct in science; review all final reports of investigations to ensure that any findings and recommendations are sufficiently documented; and make final recommendations to the Assistant Secretary for

Health on whether any sanctions should be imposed by DHHS and, if so, what they should be.

As the biomedical and behavioral research community continues to adopt policies and procedures that deal effectively with allegations or suspicions of scientific misconduct, the OSI should find fewer occasions to conduct its own investigations. Strong institutional frameworks for dealing with scientific misconduct also will enable the PHS to focus on its primary responsibilities in this area; namely, monitoring institutional compliance with PHS policies and regulations and developing prevention and education programs.

It is widely believed that scientific misconduct is not widespread. Nevertheless, even a small number of instances of scientific misconduct is unacceptable. As the steward of the vast majority of available federal awards for biomedical and behavioral research, the PHS will ensure that an effective process is in place for dealing with scientific misconduct.

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Faculty Salaries

Daniel E. Koshland, Jr.'s editorial "A new approach to faculty salaries" (24 Mar., p. 1533) illuminates the absurdity of salary practices in academia when these become excessively driven by external pressure. If faculty members can negotiate a substantial merit increase in salary (assuming one is deserved) only by obtaining an outside offer from another university or from industry, the home university has, to some degree, abrogated its own responsibility for determining the merit salary of its faculty members. It then runs the considerable risk of losing some of its most distinguished members when their momentum begins to swing elsewhere in response to the need to seek a competitive offer. While external offers provide evidence of a faculty member's merit value, they do not replace the home university's own need to determine this value within the context of its own mission. The home university should not be the last to know about the national reputation of any of its faculty members.

Koshland's concern that low salaries might dissuade young scientists from an academic career seems well founded. Once upon a time, budding scientists could rationalize the prospects of a low salary by thinking that other qualities associated with the "good academic life" would more than compensate for inadequate salary. Current students know full well that such qualities are endangered by competitive pressures to obtain grants, by the need to submerge one's own research interests for the sake of big-team science, and by the scarcity of amenities in university life. If the nation were faced with a surfeit of would-be scientists inclined toward an academic career, the current disincentives in salary, facilities, and sheer anxiety associated with this career path would make perfect sense. But given the prospects associated with a short supply of such individuals, it will be necessary to either lower standards or increase the attractiveness of an academic career.

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Carbon-Sequestering Science: An Alternative to "Pesky Electronics"?

With concern growing over the accumulation of carbon in the atmosphere leading to global warming through the greenhouse effect, the public is interested in what scientists can contribute to the solution of the problem. Indirectly, we can provide information on the extent of the problem and on solutions such as energy conservation, use of clean fuels, deforestation, and reforestation. Directly, scientists appear to have little to offer.

I would like to suggest, however, that science does have a role to play, both directly and by example. Scientific libraries are a modest but useful carbon sink, exactly the sort of sequestration proposed by Norman Myers, as quoted in William Booth's News & Comment article "Johnny Appleseed and the greenhouse" (7 Oct. 1988, p. 19). Libraries attempt to preserve their books, thus preventing carbon release. Rather than the extremely energy-inefficient proposal of cutting and burying whole forests underground or at sea, as suggested by Myers, I propose that scientists be encouraged to publish and that more public funds be made available for their carbon-sequestering literary activities through increased support for library establishment and maintenance, subsidized subscriptions, and research grants to generate the research necessary for yet more publications.

There are those who complain about the information glut in science and about overpublishing. While such logic may be appropriate within the limited perspective of science itself, it shows a sad lack of acceptance of our wider responsibilities to society. Referees and editors should consider manuscripts in the context of global climate change and seek to expand scientific carbon sequestering. Scientists should produce and overproduce. We are doing so anyway; now we have an excuse. Indeed, using science as an example, society should encourage a return to book reading and owning and should discourage all those pesky electronics, such as compact disks and televisions, that will do little to keep our seas from rising or our farms from drying out. A grateful world will thank us.

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Fusion Reaction

Robert Pool's article "Fusion breakthrough?" (Research News, 31 Mar., p. 1661) contains the statement, "The reaction [fusion] releases energy because less binding energy is needed to hold together the protons and neutron of the helium-3 nucleus than is needed to hold together two nuclei of deuterium." Part of this statement is incorrect. When free protons and neutrons combine to form a bound nuclear system, the mass of the nucleus thus formed is less than the total mass of the free particles. The "missing mass" is released as energy—the binding energy (B) of the system. For the helium-3 nucleus, $B(^3\mathrm{He}) = 7.71$ megaelectron volts (MeV), and $B(\mathrm{d}) = 2.22$ MeV for the deuterium nucleus (d). In the fusion reaction $\mathrm{d} + \mathrm{d} \rightarrow {}^3\mathrm{He}$, energy is released because the B of ^{3}He (7.71 MeV) is more than the sum of the B of the reactants (4.44 MeV). The energy released is the difference in the amount of about 3.27 MeV. This is shared by the ^{3}He and the neutron, the products of the reaction.

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Erratum: In figure 4 (p. 774) of the article "The greenhouse effect: Science and policy" by Stephen H. Schneider (10 Feb., p. 771), labels for "F_{11}" and "F_{12}" were mistakenly reversed. The figure is also mislabeled in (*18*) [V. Ramanathan *et al.*, *J. Geophys. Res.* **90**, 5547 (1985)]. The correct figure is figure 24 in V. Ramanathan *et al.*, *Rev. Geophys.* **25**, 1441 (1987). Also, the reference in table 1 of the article by Schneider should have been (*53*), not (*49*).

Erratum: In the Research News Article by Richard A. Kerr, "Does chaos permeate the solar system?" (14 Apr., p. 144), the orbital period of Mercury was misstated. The correct value is 88 days.