

LETTERS

Straightforward

Some readers find a book review of *The Flight from Science and Reason* to be "unrewarding" and "pointless"; others find "elegant vocabulary" and "acerbic but perceptive" criticism. A researcher makes the case "for going forward with large-scale vaccination programs" if an HIV-1 vaccine reduces the "virus load" in patients—even if it does not prevent infection. And the age of the universe is recalculated, approximately.



Deconstructing Science

Paul Forman's lengthy review of *The Flight from Science and Reason* (1) (2 May, p. 750) exemplifies why the current science squabbles can be so unrewarding. Allocating epithets like "rabid," "soreheads," and "myopic," Forman catalogs diversities among the authors, but he does little to identify what they are arguing against or even to clarify what is meant by terms.

Thoughtful reviewers might wonder if scientists' discontents could spring from concerns beyond the fear of being toppled from their pedestals. Might some of that dismay be due to scientists seeing "science studies" rife with the selection of data to fit hypotheses, with quantitations over all science on selected cases, with errors in understanding scientific issues, with ambiguous and undefined terminology, and with the tone Forman so well displays?

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References

1. P. R. Gross, N. Levitt, M. W. Lewis, Eds., *The Flight from Science and Reason* (Johns Hopkins Univ. Press, Baltimore, MD, 1997).

The Flight from Science and Reason (1, 2), of which I was one of the editors, contains an essay by physicist and educator James Trefil. The piece, "Scientific literacy" (2, pp. 543–550), deals in a sober, straightforward, and unpolemical way with the problem of devising a college-level science curriculum for nonscience majors. It explains the need for a wide spectrum of students to obtain some conceptual understanding of physics, chemistry, and biology and also briefly sketches methods for achieving this.

The review of the book was put in the hands of Paul Forman. Here, in full, are

Forman's remarks about Trefil:

Here one finds Ivy-disparaging physicist/popularizer James ("grew up on the wrong side of the tracks") Trefil confidently hawking his snake-oil cure for scientific illiteracy. . . .

Readers of Trefil's essay—indeed, anyone familiar with his many books—will wonder what could have possessed *Science* to print Forman's pointless jeer (3). Its one virtue is presumably unintended; it dispels whatever doubts may remain that a flight from science and reason does indeed exist.

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References and Notes

1. P. R. Gross, N. Levitt, M. W. Lewis, Eds., *Ann. N.Y. Acad. Sci.* (no. 755) (1996).
2. *The Flight from Science and Reason* (Johns Hopkins Univ. Press, Baltimore, MD, 1997).
3. The words "Ivy-disparaging" refer to the fact that supposedly elite colleges are not doing a particularly good job of general education in science; the phrase "wrong side of the tracks" refers to Trefil's brief allusion to his own unaffluent childhood. Also, the headline of the review, "Assailing the Seasons," refers, presumably, to Edward Arlington Robinson's poem "Miniver Cheevy." Precisely who is guilty of Miniver Cheevyism is an interesting point.

Congratulations! I had thought that with the publication of Alan Sokal's famous spoof of postmodern scholarship in *Social Text* (1), the last word had been said on this subject. With the able assistance of Paul Forman, however, this art form has been taken to a new height. The review has everything—the condescension, the notion that a serious idea can be dismissed with a nasty comment, even the ability to fill pages of print without once getting at the main idea of the book being reviewed. Best of all, when the writer gets into material he does not appear to understand and can't attack any other way, he manages to mimic the kind of name calling so often seen in this

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kind of writing! You couldn't possibly have published a better parody of what passes for scholarship in the postmodern world.

Um, it was a parody, wasn't it?

James Trefil

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References

1. A. Sokal, *Soc. Text* **46/47**, 217 (Spring/Summer 1996).

Forman's review contains several curious remarks about "Imaginary gardens with real toads," my contribution to the symposium *The Flight from Science and Reason* (1, pp. 11-30). The gardens of science do contain some real toads, but Forman has unloaded his own straw toads.

After quoting with approval David Goodstein's comments on scrapping the Myth of the Noble Scientist, Forman says that it offers a "welcome antidote" to my essay. That's odd, because a good part of my essay is devoted to explaining and illustrating why it is that scientists, ignoble or not, and subject to "human frailties and cultural contingencies," nonetheless can attain objective truths. Goodstein has told me, emphatically, that that is also his view (2). It

has often been ably explicated, especially by Michael Polanyi (3) and Peter Medawar (4), but deserves emphasis, for critics who "cannot imagine that toadish scientists could discover real gardens" (1, p. 18).

After assailing me as a "scientific realist," but one who indulges in "parabolic invention," Forman shifts gears and says I'm really "a postmodern-despite-himself" (5). As evidence, he asserts that I take "a cure for AIDS, rather than knowledge for its own sake, as a prototypical goal." Any prospect for a cure for AIDS certainly should be pursued. But it was not a goal of the research saga I traced; that sought fundamental understanding of atomic properties, but yielded a bounty of results and tools of amazing scope. It strikes me as "hyperbolic invention" to allege as postmodern aims that have been intrinsic to science for centuries.

My appeal to "cultivate common ground, shared by science and the liberal arts" (1, p. 24), and advocated by many scientists [see, for example, (6)] is also construed by Forman as indicating that I subscribe to "our [postmodern] . . . morality-based rather than truth-based *Weltgefühl*." Posing such a dichotomy seems to me downright perverse; surely truth-seeking and truth-telling, paramount in science, are moral (7).

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References and Notes

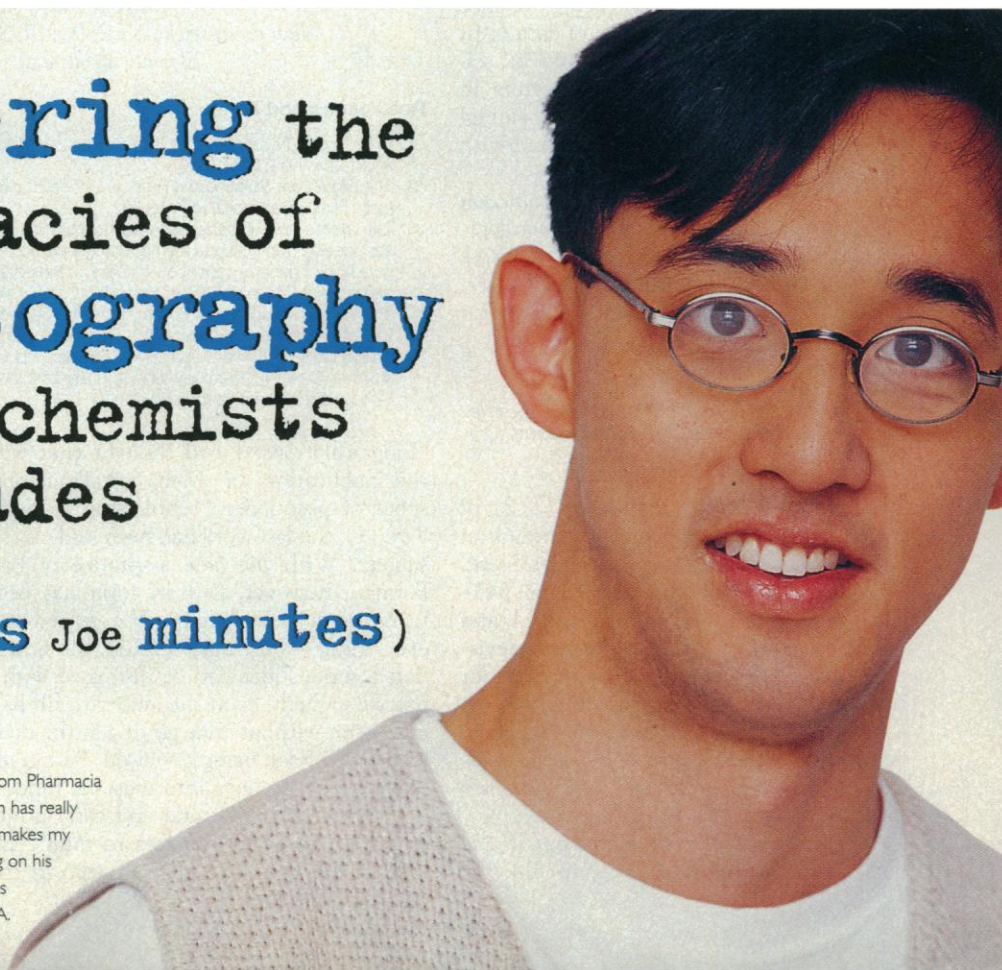
1. P. R. Gross, N. Levitt, M. W. Lewis, Eds., *The Flight from Science and Reason* (Johns Hopkins Univ. Press, Baltimore, MD 1997).
2. D. Goodstein, personal communication.
3. M. Polanyi, *Personal Knowledge* (Univ. of Chicago Press, Chicago, 1962).
4. P. Medawar, *The Limits of Science* (Oxford Univ. Press, Oxford, 1984).
5. It is not disagreeable to be certified as a postmodern realist or vice versa (even if I'm not sure what that means). Years ago a colleague observed that a theorist thought I was an experimentalist and vice versa.
6. J. M. Prausnitz, *ChemTech* **23**, 12 (1993); R. Hoffmann, *The Same and Not the Same* (Columbia Univ. Press, New York, 1995).
7. J. Bronowski, *Science and Human Values* (Harper & Row, New York, revised ed., 1965).

I admire Forman's rich and elegant vocabulary. I am also impressed by his ability to deconstruct the writing of a number of distinguished scientists and show that practically none of them is saying what he thinks he's saying and that most of them don't even think what they think they think. There must, however, be a more constructive use for so much erudition, only who

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knows what "constructive" means these days.

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Forman's acerbic but perceptive review of *The Flight from Science and Reason* (1) may cause some readers to suspect that he is a spokesperson for an evil empire—the Academic Left—that is allegedly in control of most branches of scholarship and has orchestrated the onslaught on science. To the degree that this empire has any basis in reality, however, it owes its viability partly to the indifference of the scientific community. An indifference that, until quite recently, manifested itself by the paucity of dialog and debate between scientists and those social scientists who are characterized in Forman's review as "post-modernists, feminists, relativists . . . [and] social constructivists. . . ."

The lack of substantive dialogue was, in my view, a significant enabling factor in the ascendancy of postmodernist ideas about the nature of science during the two decades before 1994. In that year the publication of Gross, Levitt, and Lewis' *Higher Superstition*

(2) initiated such a dialog, and interest in the issues addressed was subsequently reinforced by *The Flight from Science and Reason*.

I applaud the choice of an historian (and one who is competent to address flaws in the book's arguments) as the reviewer, because his remarks constitute a continuation of the healthy dialog between scientists and social scientists. Whether or not one agrees with Forman's assessment of the book, his comments provide a salutary reminder that such books do not mark the end or even the beginning of the end of the "science wars," but merely the end of the beginning (*pace* Churchill).

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References

1. P. R. Gross, N. Levitt, M. W. Lewis, *The Flight from Science and Reason* (Johns Hopkins Univ. Press, Baltimore, MD, 1994).
2. P. R. Gross and N. Levitt, *Higher Superstition* (Johns Hopkins Univ. Press, Baltimore, MD, 1994).

Response: I am sorry that *Science* has chosen not to publish Levitt's letter in full, in the form he kindly communicated it to me. Its readers might then have wondered whether the chief purpose of that letter was to en-

sure that such discussion as Ziegler calls for will not continue to take place in the pages of *Science*. I am, nonetheless, grateful to *Science* for publishing this much of Levitt's letter, for otherwise readers of Trefil's letter would have had no clue that he too writes as one criticized in my review. And I am grateful to Herschbach for making clear to the readers of *Science* that of which Levitt's letter offers no clue, namely, that the volume edited by Gross, Levitt, and Lewis contains more than just Trefil's paper. Although Levitt quotes "in full" my remarks about Trefil, he refrains from quoting in full my sentence containing those remarks.

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Curtailing the AIDS Pandemic

The decision not to go forward with phase III efficacy trials of human immunodeficiency virus type-1 (HIV-1) vaccines in the United States in 1994 (Research News, 17 Dec. 1993, p. 1820) was based in part on the paucity of data suggesting that current vaccine candidates would provide sterilizing immunity, as

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