

- Verlag, New York (1979), p. 460.
5. T. Y. Cao, *Conceptual Developments of 20th Century Field Theories*, Cambridge U. Press, New York (1997).
 6. H. Casimir, *Haphazard Reality*, Harper & Row, New York (1983); appendix B, p. 322.
 7. See ref. 4, p. 252.

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Ailing Russian Scientist Jailed

As chair of the Committee on the International Freedom of Scientists of the American Physical Society, I am writing to alert our community to the situation of a fellow physicist in Krasnoyarsk, Russia. CIFS is charged by APS with monitoring the rights of physicists and other scientists around the world.

Recently, CIFS learned that Valentin Danilov, head of the Thermo-Physics Center at Krasnoyarsk State Technical University, had been arrested and incarcerated in February and charged in April with selling state secrets to a Chinese company. According to quotes from Russia's Federal Security Service in a Reuters news article, Danilov's relations with this company have "allowed foreign countries to significantly cut the amount of time and money spent on the development and creation of spacecraft."

Danilov was, in fact, the signatory for a legal contract between Krasnoyarsk State Technical University and the Chinese company to create a model to predict the effect of the electromagnetic environment on satellites. Danilov has done significant research in this area, and this work was declassified by the Russian government in 1992. Researchers in the US and Russia with whom Danilov has collaborated indicate that the information provided under this contract has for years been readily available in the scientific literature, including meeting abstracts and materials published by APS. It is difficult for CIFS to understand how Dr. Danilov could be accused of disclosing "state secrets" when our Chinese colleagues have had access to the same information for almost a decade through publicly available scientific literature.

In an attempt to verify these accounts and to inform authorities of Danilov's deteriorating health (he suffers from hypertension), both CIFS and APS President George Trilling wrote to President Vladimir Putin. CIFS also has sent inquiries to the mayor of Krasnoyarsk and the governor of Krasnoyarsk region. To date, no response has been received to any of these inquiries. Suggestions and help from the physics community for immediately resolving this urgent and troubling case are welcome. They may be sent to me at the e-mail address below; I will bring all such correspondence to the attention of the members of CIFS.

Danilov was admitted to the hospital in mid-June after suffering a heart attack. It is reported that he is chained to the bed. This information has been verified by Danilov's attorney and his wife.

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Kuhn's Paradigm and a Scientific Border Dispute

In his review of my book *Thomas Kuhn: A Philosophical History for Our Times*, Kenneth Wilson (PHYSICS TODAY, March 2001, page 53) proves to be more Kuhnian than perhaps Kuhn himself. But since I argue that Kuhn's paradigm-based theory of scientific change was largely a bad idea that nevertheless suited its time, it should come as no surprise that Wilson misses the spirit of much of what I wrote.

To be sure, Wilson compliments my book for its account of the philosophy and sociology of science as "pre-paradigm" sciences. He seems to think that these fields are about to embark on a Kuhnian trajectory to normal science, which he takes to be a good thing. However, my point was that, insofar as philosophy and sociology of science have adopted Kuhn's model as their own, they have lost much of their critical edge and have become increasingly obtuse to the changing social character of scientific work.

But would Wilson want to see these fields become paradigms? A strict Kuhnian line implies that professional philosophers and sociologists would be the sole arbiters of what counts as adequate philosophi-

cal and sociological research about science. Just as a paradigm-defining moment in the history of science came when the experimentalist Robert Boyle successfully excluded the metaphysician Thomas Hobbes from the Royal Society, so, too, philosophers and sociologists of science would need to exclude scientists from their ranks. And just as we no longer expect experimental scientists to know much about metaphysics, so, too, we would come not to expect philosophers and sociologists of science to know much about science.

So the strict Kuhnian line is simply the "hard line" adopted by many science studies scholars in the ongoing "science wars." I doubt that Wilson would want to follow Kuhn's logic this far, since it would render the philosophy and sociology of science irrelevant to the conduct of science. But if philosophy and sociology of science should remain permeable to scientists, then scientists must also keep their borders open to philosophical and sociological investigation.

Getting beyond Kuhn requires more than mutual accommodation or, as Wilson suggests, a role for science studies as the public relations wing of the scientific community. Rather, it involves a concerted effort to disarm the institutional and intellectual borders that currently divide practitioners of the natural and human sciences. The first step, as I argue in *Thomas Kuhn*, would be to reintegrate the study of history, philosophy, and sociology into the natural science curriculum. For Kuhn, this would be the ultimate step backward in science. But then Kuhn also denied that the sciences were united in a quest to understand a common reality that transcends any particular paradigm.

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WILSON REPLIES: Nothing in Steve Fuller's book persuaded me that Kuhn's theory was a "bad idea." My own assessment is that details of Kuhn's analysis need revision, as stated in the review, but that, overall, Kuhn's ideas remain of major interest. I found Fuller's descriptions of the pre-paradigm phases of the philosophy and sociology of science to be his major accomplishment, even if that was not Fuller's intent.

For me, the most intriguing suggestion in Fuller's letter is his assertion that, if a paradigm emerges for the philosophy and sociology of science, one consequence would be the exclusion of scientists from these two fields. I agree that he has a serious concern; I disagree that the exclusion is likely to occur. If a paradigm emerges, I expect that initially only a small number of very talented individuals would be able to make much sense of it, just as has been the case with the major paradigms in science that Kuhn discussed in his book *The Structure of Scientific Revolutions* (U. of Chicago Press, 1962). But I also expect that one or more very talented scientists would be among those individuals, based on the quality of work that scientists such as John Ziman are already producing in the related field of science studies. See, for example, Ziman's recently published book *Real Science* (Cambridge U. Press, 2000).

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Science, Religion, Templeton Prize

With colleagues in philosophy and religious studies, I constructed a cosmology course that won a prize from the Templeton Foundation. In general, as Mark Friesel suggests (PHYSICS TODAY, February 2001, page 82), the prospect of a cash award will entice participation. The Templeton Foundation's funding of interdisciplinary study in science and religion is no exception. However, I don't believe Friesel needs to be too concerned with the integrity of the participants. Templeton awardees are probably no more likely to compromise their scholarly standards than are NSF grantees. In my case, for example, our cosmology course was constructed before we had even heard of Templeton's program for courses in science and religion.

Interdisciplinary study of religion and science can be a legitimate intellectual exercise. Here are a couple of quotes that I have used to spark classroom discussion. Enjoy!

Many scientists are deeply religious in one way or another, but all of them have a certain rather peculiar faith—they have a faith in the underlying