# The Two Cultures Revisited

**Let's try again to close the gap between the sciences and the humanities.**

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*Science Wars* is the title of a book of essays edited by Andrew Ross and published in 1996. The inflated premise of the book is that a fierce intellectual battle is being waged between the cultural critics of science and the scientific establishment. The essays in the book were in large part a response to *Higher Superstition: The Academic Left and Its Quarrels with Science*, an equally overstated jeremiad by biologist Paul R. Gross and mathematician Norman Levitt, which was published in 1994. Together, they create the impression that C. P. Snow's two cultures have become even more remote from one another.

Gross and Levitt wrote their book to warn the scientific community that a growing network of leftist scholars in the humanities and social sciences was engaged in a subversive effort to undermine public faith in rationalism and the objectivity of science. They strung together quotes-often out of context and often misinterpreted-from a broad array of feminists, luddites, Marxists, and postmodernists to create the image of a loosely linked radical coalition determined to topple science from its pedestal of public respect. They uncovered much that was misinformed, misguided, and downright wacky. They then characterized this as the perspective of the "academic left," though they admitted that this was in no way synonomous with what everyone else called the academic left. The implication was that science represented all that was rational and good, and that all critiques of science were lunatic attempts to undermine Western political, economic, and intellectual traditions. The only conceivable response to such an onslaught was to take whatever action was necessary to discredit the enemy.

In his introduction to Science Wars, Andrew Ross makes a valiant effort to demonstrate that the Gross/Levitt caricature is accurate. He points to a crisis in science resulting from research that finds environmental and health hazards being produced by advanced technology and thus challenges science's strong link to military, corporate, and state interests. He goes on to link this to a crisis in industrial capitalism and claims that the defenders of science are engaged in a Science War that is an extension of the Culture War conducted by conservatives against feminism, multiculturalism, and secular humanism. In Ross's words, "all the fine talk about the enlightened pursuit of public knowledge" is in reality a screen for the fact that "secrecy and competition are the guiding principles of research." In his view, the claims of scientific objectivity are an attempt to conceal the fact that science's values are actually those of an extreme form of free market capitalism. This is a caricature of Ross's view, but he does say things that allow him to be caricatured.

The selections in Ross's book cannot be so easily ridiculed. Political scientist Langdon Winner, English professor George Levine, sociologist Dorothy Nelkin, biologist Richard C. Lewontin, and others do not indulge in broad swipes at capitalism, and do not make ungrounded generalizations about who controls science, do not pretend that science rests on a crumbling foundation. They do, however, argue convincingly that scientists are too unwilling to examine the social, political, and philosophical aspects of their work. They make important distinctions about what scholars in other disciplines can add to an understanding of science. They refuse to be taken in by the assertion

that the practice of science can be free of its cultural and economic environment, that some magical scientific method insulates it from the forces that shape all other human endeavors.

Langdon Winner points out that studies of science fall into four broad categories: 1) straightforward, and almost always favorable, descriptions of how science and technology operate in practice; 2) the application to science of analytic approaches that have been used to study other segments of society; 3)the study of the role that science plays in addressing practical social problems such as public health, environment, and defense; and 4) the work of philosophers and social theorists who examine the deep structure of ideas and institutions that form the foundation of our social system. Lumping all of these together, as Gross and Levitt do, is pointless. For example, the second approach aims to distinguish how science differs from other social institutions, and the last seeks to identify the deeper connections that link science to other contemporary institutions. The third approach (which is characteristic of *Issues*) ignores these more abstract questions and looks only at the practical policy choices that are influenced by science.

The critics of science are also guilty of some unwonted lumping. They commonly write of a scientific method or a scientific approach to knowledge that overlooks the variety of approaches that characterize the various fields of study. They would do well to read scientists such as Freeman Dyson and Stephen Jay Gould, who provide insights into the profound differences between the use of an inductive approach in biology and a deductive approach in physics.

## The bigger picture

Most scientists most of the time could care less about these debates. Their attitude is that what is said in the English department, wherever it happens to be on campus, has no effect on science or on public opinion about science. What attracted more attention to these issues a few years ago was the fact that federal support for science was expected to fall dramatically, and Sen. Barbara Mikulski, who then chaired the Senate appropriations subcommittee that set funding levels, was demanding that research be guided not just by the interests of scientists but also by the specific needs of the nation. Fearing that their funding and their freedom to control that funding were in danger, scientists felt besieged and were prepared to do battle with all their enemies-real or imagined: Perhaps these muddleheaded academics were actually undermining public faith in science.

Other unrelated social trends were also perceived to be part of the conspiracy. New Age philosophy with its accompanying belief in nonrational ways of thinking was gaining adherents. A disturbing number of people expressed faith in alternative medicine in spite of the absence of scientific evidence to support it. Extremists in the environmental movement voiced their antipathy to all modern technology. The Unabomber was

still on the loose. Assessments of public understanding of science revealed appalling ignorance, even among college graduates. To some, it appeared that science was on the ropes.

The background is different today. As the "Straight Talk" column in this issue illustrates, bipartisan support is building in Congress to not just maintain but to increase federal research spending. Sen. Mikulski (D-Md.) was replaced as chair of her subcommittee when the Republicans captured the Senate, and the discussion of "directed" basic research has subsided. New Age ideas are still common, but they are now seen as nonscientific rather than anti-scientific. Alternative medicine has become even more popular, and the federal government is now funding a small program to evaluate unconventional practices. Concern remains that pressure from a few members of Congress who are true believers will prevent the Office of Alternative Medicine from being an objective source of information, but the more public attention is devoted to evaluation of these techniques the more likely it is that accurate information will emerge. Since the death of Edward Abbey, the most articulate member of the Earth First wing of environmentalism, the influence of the radical fringe has diminished markedly.

Lack of scientific understanding among the public remains a problem, but the public itself is dissatisfied with the current state of affairs. The focus of attention this year has been on students. The most recent report from the Third International Math and Science Study revealed that U.S. high school students trail behind their contemporaries in most countries in their knowledge of math and science. This was front page news across the country and was followed by editorials and political speeches calling for renewed attention to these subjects in school. Virtually no one questioned the value of science or the importance of ensuring that all students have a fundamental understanding of science.

One of the fears that preoccupied Gross and Levitt was that the schools would soon be teaching feminist science or Afrocentric science. At the time they wrote their book, there was a proposed Afrocentric science curriculum, but it was soon laughed out of consideration. Since then, the only curricula receiving serious attention were those aimed at implementing the standards developed by the National Academy of Sciences.

## Beyond caricature

Now that scientists are feeling more comfortable about their government support and now that the most ludicrous antiscience notions have receded to the fringe, what are we to make of the analyses of science being done by cultural critics, sociologists, and philosophers? The tendency among scientists is to do what they've always done-ignore them. Success breeds complacency. If society is supporting us, we must be doing what's right.

Gross and Levitt allowed in their book that there was a place for a critical analysis of the interplay of social and cultural forces with scientific research. But in their view, this study would require such rigor and detailed insight that it could be conducted only by "a scientist of professional competence, or nearly so." Apparently, only someone who was a member of the culture could understand it well enough to evaluate it reliably and objectively. Let's hope that they don't apply the same standard to criminology. The simple truth is that they have little respect for the analytic skills of those in the humanities or the social sciences.

The advantage of having scholars from other disciplines look at science is that they don't look at it the same way that scientists do. Within science there is a growing awareness of interdisciplinary studies. Chemistry can make a contribution to physics or biology because chemists do not approach problems in the same way. Of course, a chemist can go only so far without the help of a physicist or biologist. This is what should also be happening in cultural studies of science.

Two factors contributed to the tendency of some people to imagine that we were traveling down the path to science wars in the early 1990s. The first was a sense of crisis among scientists about funding prospects and the second was that scientists and the critics of science had had so little interaction that it was easy for each side to imagine the worst about the other. The result was a battle between the irrational and destructive forces of the academic left and the pawns of the military-industrial complex. The outcome was of no interest to the majority of scientists and humanists that dwell in the vast middle ground between these extremes.

The current zeitgeist is much more favorable for science and provides a climate in which scientists can interact with analysts of science without feeling threatened. There has been much discussion in recent years about the need to forge a new social contract between science and the nation. The implicit contract developed by Vannevar Bush at the end of World War II is out of date for a post-Cold War world. Although many members of Congress are willing to support increased research funding, Rep. James Sensenbrenner (R-Wisc.), the chair of the House Science Committee, has said that he is not willing to support increased funding without an updated rationale for that spending. Rep. Vernon Ehlers ( R-Mich.) is leading an effort to develop that rationale. Although he is not likely to consult with cultural critics of science, it would be wise for scientists to begin a dialogue. There is probably no point in meeting with the radical fringe that alarmed Gross and Levitt, but there is no shortage of responsible and thoughtful scholars who could help scientists gain a fresh perspective on their work. In addition, the work of these scholars would be better grounded and more likely to be taken seriously if they had more direct interaction with scientists.

An encouraging sign that such an interaction might be beginning can be found in the March 1998 *Atlantic Monthly.* In an article entitled "Back from Chaos," Harvard University entomologist E. O. Wilson addresses the philosophical underpinnings of science and the postmodernist challenge to the authority of science. Academic theorists are likely to consider Wilson's endorsement of Enlightenment thinking to be quaintly

old-fashioned and his hope for an intellectual consilience (which Wilson defines as "jumping together" of knowledge across disciplines) between the sciences and the humanities to be naively optimistic, but at least he is willing to take the analyses of nonscientists seriously and to seek more interaction. Besides, Wilson's article is more likely to strike a chord with the educated public than is the type of aggressively opaque jargon that is often found in the work of the theorists.

The best work will come when scientists and nonscientists work cooperatively to develop ideas that incorporate a working knowledge of science as it is practiced today with a sophisticated understanding of modern intellectual directions. As Wilson notes, experts in all disciplines suffer from too narrow a focus. The movement toward interdisciplinary work among the sciences should be extended to include the humanities.

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