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July 21, 2001

## Coming to Blows Over How Valid Science Really Is

By EDWARD ROTHSTEIN

**S**ometime in 1962, to paraphrase Virginia Woolf, the world changed. That year a physicist and historian of science, Thomas S. Kuhn, did for conceptions of science what Copernicus and Einstein did for astronomy and physics. He led a revolution, at least if one accepts the analysis in his book, "The Structure of Scientific Revolutions," which has sold over a million copies in 20 languages.



Jim Wilson/The New York Times  
 Thomas S. Kuhn, shown here in 1982, tried to protect his original ideas from their logical consequences.

Kuhn introduced the now common notion of paradigm as an accepted set of principles by which the world is viewed. When a paradigm shifts, when, for example, the earth is no longer seen as the center of the universe, old notions of truth are discarded and new ones take their place.

But that wasn't all Kuhn said. He argued that new paradigms are no more valid than the old; they just turn out to be more useful. Kuhn dismissed the idea of scientific progress, portraying scientists as a self-regulated guild that excommunicates dissenters and is preoccupied with what he dismissively referred to as puzzle-solving.

The implications of these ideas turned out to be far more controversial than Kuhn initially imagined, and five years after his death the debate over his intellectual revolution continues.

At least three books by and about Kuhn have been published in the last year, attacking and defending him. "Thomas Kuhn" (Princeton University Press) by Alexander Bird, a philosopher at the University of Edinburgh, evaluates Kuhn's analyses of normal and revolutionary science, providing a critical yet sympathetic interpretation.

More eccentric and politically charged is "Thomas Kuhn: A Philosophical History for Our Times" (University of Chicago Press) by Steve Fuller, a sociologist at the University of Warwick in England, who laves into Kuhn for his elitist and cultic view of science.

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Finally, in "The Road Since Structure" (University of Chicago Press), Kuhn's own essays are collected, chronicling how, for over 30 years, he expanded on his initial ideas while trying to protect them from their logical consequences.

The problem is that many of Kuhn's ideas have become part of the postmodernist paradigm. According to this set of ideas, Western science is hardly neutral and objective. Instead it is full of unexamined prejudices and preferences and presumptions. More radically, philosophers of science like Paul Feyerabend have argued that even explanatory systems like mythology and astrology stake claims as valid as those of Western science.

And Kuhn himself argued that ideas that have been rejected by contemporary science — that heat, for example, is caused by phlogiston or that mental health is regulated by humors in the body — have been rejected not because they were wrong but because they no longer served the needs of scientists.

In other words, the truth is up for grabs. There is, according to Kuhn, "no standard higher than the assent of the relevant community."

Kuhn also said that when a new paradigm is created, conservative and revolutionary forces fight over its acceptance. This is what happened with Kuhn's paradigm, leading to the familiar culture wars (over education and the centrality of Western culture) and science wars (over truth and relativism).

One of the most famous science-oriented skirmishes occurred in 1996, the year Kuhn died. A physicist at New York University, Alan Sokal, wrote a parody of postmodern, relativistic and political views of science, riddling his paper with errors. The editors of the journal *Social Text* published it, catching neither the errors nor the satire. Mr. Sokal's prank, which drew worldwide attention, demonstrated the absurdities of extreme Kuhnianism and showed how some influential scholars cared less about scientific accuracy than about allegiance to ideologies.

Kuhn, too, objected to relativistic arguments. Despite the assertions of some of his followers, Kuhn insisted in "The Road Since Structure" that the world had an objective existence, that it was "not invented or constructed." Indeed, he said, scientific exploration is bound by the nature of that world. But Kuhn's attempts to reconcile those views with the implications of his earlier views created their own controversies.

In his book, for example, Mr. Bird argues that Kuhn's dismissal of absolute truth and his attacks on the idea of scientific progress are confused and lead to a "metaphysical relativism" that was not Kuhn's intention. Mr. Bird's selective criticisms and appreciations leave Kuhn wounded but still a vital presence.

More polemically, Mr. Fuller, in his "Philosophical History," comes after Kuhn from the opposite direction, arguing not that he slighted a conservative notion of immutable truth, but that he hurt the causes of the political left. Mr. Fuller compares him to the blank-faced, illiterate character Chance in Jerzy Kosinski's novel "Being There," a mentally

sluggish freak whose cryptic pronouncements, mainly taken from television, were taken as profound by the American political elite. Kuhn, Mr. Fuller asserts, enjoyed a success that was undeserved and fortuitous.

Mr. Fuller, in fact, suggests that Kuhn, despite his reputation, had too much allegiance to the old concepts of science. Kuhn, says Mr. Fuller, retained the "elitist myth" about "visionary geniuses" who changed the world by shifting paradigms. The notion of a coterie of specialists coming to agreement, Mr. Fuller says, supports the idea of an authoritarian, antidemocratic establishment.

"The Structure of Scientific Revolutions," Mr. Fuller writes, was an "exemplary document of the cold war era" because it portrayed scientists as a self-perpetuating cult with no obligations to consider the political consequences of their work. Far from leading to a revolution in scientific practice and power, the impact of Kuhn's book, Mr. Fuller concludes, has been to "dull the critical sensibility of the academy."

Unlike the object of his criticism, Mr. Fuller doesn't offer many scientific examples but he does follow some of Kuhn's precepts in mounting his attack. Like Kuhn, he treats scientific inquiry as a matter of sociological confrontation rather than a progress toward truth; he just thinks the confrontations should be taken out of the hands of specialists. Science, he says, should become a democratic clamor of competing ideas.

Kuhn doesn't go that far, but he does give the process of paradigm shift an authoritarian cast, even comparing scientific groups to the ruling classes of Orwell's "1984." Anybody who disagrees with the dominant scientific paradigm, he said, is "read out of the profession." In fact, Kuhn suggests, it is only when there is unanimity about a paradigm that science comes to believe it is progressing. A clamor of ideas, like the one advocated by Mr. Fuller, would eliminate even this illusion, turning science into a messy social science. But isn't this too an unavoidable extension of Kuhn's conceptions?

Philosophers still wrestle with these issues, as Mr. Bird shows. And postmodern ideas of truth have led to strong support as well as serious criticism. So Kuhn's paradigm is still under contention. But strangely, its influence has affected the social sciences far more than the sciences. Research scientists continue their work, regardless of Kuhn's interpretations. As for the social sciences, with their history of contention, disagreement and rival paradigms, the Kuhnian revolution has hardly seemed necessary.

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