



# Wronger Than Wrong

Not all wrong theories are equal By MICHAEL SHERMER

**In belles lettres** the witty literary slight has evolved into a genre because, as 20th-century trial lawyer Louis Nizer noted, "A graceful taunt is worth a thousand insults." To wit, from high culture, Mark Twain: "I didn't attend the funeral, but I sent a nice letter saying I approved of it." Winston Churchill: "He has all the virtues I dislike and none of the vices I admire." And from pop culture, Groucho Marx: "I've had a perfectly wonderful evening. But this wasn't it." Scientists are no slouches when it comes to pitching invectives at colleagues. Achieving almost canonical status as the ne plus ultra put-down is theoretical physicist Wolfgang Pauli's reported harsh critique of a paper: "This isn't right. It's not even wrong." I call this Pauli's proverb.

Columbia University mathematician Peter Woit recently employed Pauli's proverb in his book title, a critique of string theory called *Not Even Wrong* (Basic Books, 2006). String theory, Woit argues, is not only based on nontestable hypotheses, it depends far too much on the aesthetic nature of its mathematics and the eminence of its proponents. In science, if an idea is not falsifiable, it is not that it is wrong, it is that we cannot determine if it is wrong, and thus it is not even wrong.

Not even wrong. What could be worse? Being wronger than wrong, or what I call Asimov's axiom, well stated in his book *The Relativity of Wrong* (Doubleday, 1988): "When people thought the earth was flat, they were wrong. When people thought the earth was spherical, they were wrong. But if you think that thinking the earth is spherical is just as wrong as thinking the earth is flat, then your view is wronger than both of them put together."

Asimov's axiom holds that science is cumulative and progressive, building on the mistakes of the past, and that even though scientists are often wrong, their wrongness attenuates with continued data collection and theory building. Satellite measurements, for instance, have shown precisely how the earth's shape differs from a perfect sphere.


The view that all wrong theories are equal implies that no theory is better than any other. This is the theory of the "strong" social construction of science, which holds that sci-

ence is inextricably bound to the social, political, economic, religious and ideological predilections of a culture, particularly of those individuals in power. Scientists are knowledge capitalists who produce scientific papers that report the results of experiments conducted to test (and usually support) the hegemonic theories that reinforce the status quo.

In some extreme cases, this theory that culture shapes the way science is conducted is right. In the mid-19th century, physicians discovered that slaves suffered from *drapetomania*, or the uncontrollable urge to escape from slavery, and *dysaesthesia aethiopica*, or the tendency to be disobedient. In the late 19th and early 20th centuries, scientific measurements of racial differences in cognitive abilities found that blacks were inferior to whites. In the mid-20th century, psychiatrists discovered evidence that allowed them to classify homosexuality as a disease.

And until recently, women were considered inherently inferior in science classrooms and corporate boardrooms.

Such egregious examples, however, do not negate the extraordinary ability of science to elucidate the natural and social worlds. Reality exists, and science is the best tool yet employed to discover and describe that reality. The theory of evolution, even though it is the subject of vigorous debates about the tempo and mode of life's history, is vastly superior to the theory of creation, which is not even wrong (in Pauli's sense). As evolutionary biologist Richard Dawkins observed on this dispute: "When two opposite points of view are expressed with equal intensity, the truth does not necessarily lie exactly halfway between them. It is possible for one side to be simply wrong."

Simply wrong. When people thought that science was unbiased and unbound by culture, they were simply wrong. On the other hand, when people thought that science was completely socially constructed, they were simply wrong. But if you believe that thinking science is unbiased is just as wrong as thinking that science is socially constructed, then your view is not even wronger than wrong. 

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**Scientists' wrongness attenuates with time.**

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