

SCIENCE POLICY

The battle lines are drawn

In a stirring call to action, an author probes the forces that undermine evidence-based science policy

By **Peter R. Reczek**

After a close brush with the Catholic Church in 1624, the Italian scientist Galileo Galilei anonymously published a book advancing the heliocentric theory of Copernicus in 1632. Galileo called one of the book's fictitious characters Simplicio or simpleton—an unfortunate turn of phrase that Pope Urban VIII, a longtime friend and supporter, believed was a veiled reference to him. Outraged, he brought Galileo before a tribunal of the Roman Inquisition. The examiners coerced him into recanting his written statements, and he was placed under house arrest, where he died almost 10 years later.

In his new book, *The War on Science*, Shawn Otto documents the modern clash between what he calls the “authoritarians” (governments, large corporations, and religious groups) and the “antiauthoritarians” (scientists and other liberal thinkers). Drawing on recent examples ranging from the evolution debate to vaccine skepticism, Otto describes the emergence of an antiscience movement whose focus is to disrupt the creation of evidence-based policy for the sake of preserving profitable business models or entrenched religious dogma.

Otto is at his best when he describes the processes that culminated in the widespread denial of human-caused climate change. Exxon executives recognized climatic changes due to the burning of fossil fuels as long ago as 1977, he writes. At that time, Otto claims, a loose collaboration among several energy companies began a public relations campaign to discredit scientific reports of climate change. He meticulously references news reports, books, and email messages demonstrating techniques that parallel the steps taken by tobacco companies to deny a link between smoking and lung cancer. In doing so, Otto reminds us how advocates for both groups often cherry-picked data while focusing on anomalies in the results and played favorable

games with statistics to minimize the dangers of smoking and climate change, respectively.

In a chapter entitled “The Industrial War on Science,” Otto alleges that a carefully coordinated attack on scientists and the scientific process has undermined scientific credibility and has led to a position where “the climate debate” is all but unwinnable. Only unequiv-



Citing polls conducted at the beginning of the new millennium, Otto reveals that 52% of Americans believe that humans and dinosaurs once coexisted.

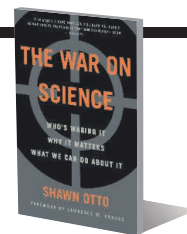
ocal statements by highly regarded leaders will substantially reverse this trend, he argues. Pope Francis has taken such a step in his encyclical *Laudato Si'* (1).

The problem, however, extends beyond climate change denial. The same tactics are being used to undermine other technocentric policies, including the push to “teach the [supposed] controversy” between evolution and intelligent design, as well as legislation governing stem cell research.

Evidence-based policy-making is a necessity if we are to continue to advance in a highly technologically dependent world. Otto outlines tactics that have been used successfully by such advocacy groups as the Union of Concerned Scientists and its

The War on Science
Who's Waging It,
Why It Matters,
What We Can Do About It

Shawn Otto
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Center for Science and Democracy, which broadened its focus to target issues such as climate change and scientific integrity, and Greenpeace, whose efforts to combine civil action with creative communication serve as an international model for other conservation-based organizations.

Using the language of warfare, Otto suggests that the first step is to know the enemy. Scientists must realize, for example, that antiscience groups often attempt to redefine scientific terms in such a way as to enable opponents to debate science as if it were an opinion. (Evolution is “just a theory,” right?)

Otto also argues for direct engagement between scientists and the general public. To avoid the fate that befell Galileo, scientists must understand that 21st-century journalism has blurred the lines between objectivity and subjectivity, sometimes sacrificing deep investigation in the interests of expediency, he maintains. As more and more news outlets eliminate science sections, the journalistic inclination to give equal weight to “both sides” of topics for which there is widespread scientific consensus amplifies minority and extreme arguments.

Otto believes that unless we find ways to balance the rights of the individual with the interests of society, we are headed for what Garrett Hardin called “the tragedy of the commons” (2). To achieve this, he outlines 14 ambitious “battle plans” that include advice for everyone from educators (“Plan 6:

Teachers Should Teach Science Civics”) to funding agencies (“Plan 7: Granting Bodies Should Require and Fund More Outreach”) to potential office holders (“Plan 11: Candidates Should Sign Science Pledges”).

Scientists can no longer afford to remain sequestered in their laboratories. We need to fight back. “Call a spade a spade, and do it publicly,” Otto urges. To regain the public’s trust, we must demonstrate that science is an activity done by people for people.

REFERENCES

1. Pope Francis, *Encyclical Letter “Laudato Si’ of the Holy Father Francis, On the Care of Our Common Home”* (Holy See, Vatican City, 2015).
2. G. Hardin, *Science* **162**, 1243 (1968).

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