

Fool Me Twice

Fighting the Assault on Science in America

READERS GUIDE

A CONVERSATION WITH SHAWN LAWRENCE OTTO

Reprinted from



How Ignorance, Greed and Ideology Are Warping Science and Hurting Democracy

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"Whenever the people are well informed" an optimistic Thomas Jefferson wrote, "they can be trusted with their own government." Sure – but what if the people *have no clue*?

Most of the big challenges facing America and the world today – from climate change to disease to population growth – revolve around science and technology. If we – We, the People – are going to make smart decisions on what to do about these problems, we need to have at least a rough understanding of the basic science involved. Problem is, we don't.

As science writer Shawn Lawrence Otto points out in a tough-minded new book, [Fool Me Twice: Fighting the Assault on Science in America](#), too many Americans are either plain ignorant of science or actively hostile to it, or both. And that's as true of political leaders and journalists as it is of ordinary citizens (to say nothing of corporate leaders who see action on climate change, say, as a threat to the bottom line). We think climate change is a hoax; we're convinced vaccines cause autism; we truly believe – as Newt Gingrich claims to – that embryonic stem cell research involves killing children.

To go back to Jefferson's point, how can we be trusted with our own government – how can we take on the huge challenges we face – if we're so poorly informed? Or, as Otto puts it: "How can democracy continue to function in a century dominated by complex science, where science affects every aspect of life?" His short answer: it can't – unless we make some big changes, changes in how students learn science, in how journalists describe science, in how scientists explain themselves to the public, in how money functions in politics. We recently got Otto on the phone to talk about America's dysfunctional relationship with science. Some highlights below.

How it's harder to be "well informed" than it was in Jefferson's time

Jefferson believed it required no degree of education for people to be able to do this, but science has vastly expanded our knowledge now and most of our big policy problems do require a great deal of education to understand. This is going to be a problem that we are going to be dealing with more and more as the century unfolds.

Scientific illiteracy in Congress

Look at the 94 of 100 newly elected GOP members of Congress who have either said flat-out that they believe climate change is a vast hoax or that they have signed pledges to oppose any mitigation efforts. And this goes against all the evidence presented to every government around the world, including our own. This also

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extends to people like John Boehner, who has advocated in the past for teaching creationism in science classes, and who claims to believe that climate scientists are saying that carbon dioxide is a carcinogen.

Anti-science liberals

Democrats aren't exempt from anti-science views at all. For instance, a couple of months ago the all-Democrat San Francisco Board of Supervisors voted 10 to 1 to require cell phone shops to post warnings that cell phones may cause brain cancer, even though there's no scientific evidence whatsoever to show. Also on the Left, you see the idea that maybe vaccines cause autism, which is not supported by any science that we know of.

Key differences between anti-science views on the left and right

Largely on the left it seems to focus on mind-body purity. On the right they tend to focus on either beginning of life and issues around contraception and evolution—the things fundamentalists get all upset about—on climate change, particularly environmental and regulatory issues.

The role of vested interests in promoting anti-science views

Take climate change. Simple scientific observations and scientific evidence are challenging the vested economic interests that have grown around the internal combustion engine and hydrocarbons. They are looking at their entire business model being threatened by this new knowledge we have. And as a result, in the last ten years they've invested about \$2 billion setting up phony think tanks, doing bogus science, and spending money on lobbying and advertising efforts trying to set up a smoke screen to confuse the public.

The (unhelpful) role of the news media

Something has happened with the last generation of journalists, who have been taught the postmodern idea that there is no such thing as objective reality. But there *is* such a thing as objective reality – and we can measure it, and by measuring it we've doubled our lifespan, multiplied the productivity of our farms by 35 times, and totally changed the world. By not acknowledging that, reporters end up creating something called, "false balance," essentially reporting on two sides of a story and letting the audience decide what they think is the objective truth or who is right. That's really shirking their responsibility to dig and inform people what's really going on.

The difference between theory and opinion

Science is always provisional, that is just the nature of inductive reasoning. Scientists are very, very careful not to say that something is *absolutely* true. But, it's a mistake to think that provisional scientific knowledge is on the same level as opinion and to put someone who is telling you real knowledge that has been measured and tested and gone through peer review on par with somebody who is just giving an opinion.

How to mend America's fractured relationship with science

First of all, scientists really need to reengage in our public conversation. Most Americans, when polled, don't even know a living scientist. That's got to change. Scientists need to get back out there and talk to their neighbors, speak in churches and talk to people where they go. People need to hear that voice in our political discussion again. The voice of values and religion – those are an important part of our conversation; but we need a plurality of voices and we also need the voice of facts, and reason, and knowledge.

The other thing people can do is support an organization, a grass roots movement started by scientists and others called Sciencedebate.org, which is a call to get candidates for public office to debate these issues that they don't want to talk about, and base their points in debates on reason and knowledge and not talking points that they pull out of their rear end.

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QUESTIONS FOR DISCUSSION

1. Overall, what did you think of Fool Me Twice?
2. Science is poised to make as much new knowledge in the next 40 years as it has in the last 400 years. What do you think this will mean for democracy?
3. Do you think Western science would have become so advanced if there had been no Protestant reformation?
4. In speeches, the author often says that “science is never partisan, but science is always political.” Do you agree?
5. If you were in President Obama’s position in 2009, would you have focused on health care or climate change? Why?
6. How can the university tenure system be changed to reward more public outreach by scientists?
7. US students fell from 7th in science in a 1972 world ranking to 23rd in 2009. Why do you suppose that is?
8. When you see a science story in a newspaper do you find you generally want to read it or skip over it? Why?
9. Has denial of science by politicians always been at about the same level, or has it grown worse recently?
10. Without the influx of intellectual refugees prior to and during World War II how would the United States have been different?
11. Which is more important to good government: values or knowledge? Which should we be valuing more in a candidate for public office?
12. In the last two decades we have seen the rise of “he-said she-said” journalism. Reporters say that they are simply being careful to remove their own biases. Critics say it’s their job to dig and report the objective facts of what really happened. Who’s right?
13. Does having a global economy require us to have a global government?
14. Is there a difference between scientific and artistic creativity?
15. If all the members of congress read the book, do you think it would change anything?

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ABOUT THE AUTHOR

Shawn organized *Science Debate 2008* between Barack Obama and John McCain. He is the 2009 recipient of the *National Distinguished Public Service Award* from IEEE-USA. He served on the Science Ambassador Advisory Board of the *National Academy of Sciences*. Shawn also wrote and coproduced the Academy-Award-nominated *House of Sand and Fog*, starring Ben Kingsley and Jennifer Connelly. He is a frequent writer and speaker on film, art and science. He and/or his work and writing has appeared on or in NPR, PBS, CBS, FOX, NBC, ABC, MSNBC, the New York Times, Salon, Science, Huffington Post, Issues in Science and Technology, New Scientist, and over a hundred other media outlets worldwide. He was the keynote speaker at the *2009 Nobel conference*. Shawn designed the Ottos' wind-powered, passive solar, geothermal home, and he and his wife Rebecca Otto, the Minnesota State Auditor, built it with their own hands. The home has been featured in local and national publications and toured by thousands of people as an example of green building.

