Fool Me Twice: Fighting the Assault on Science in America

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"Whenever the people are well informed," Thomas Jefferson wrote, "they can be trusted with their own government."

But what happens in a world dominated by complex science? Are the people still well-enough informed to be trusted with their own government? And with less than 2 percent of Congress with any professional background in science, how can our government be trusted to lead us in the right direction?

Will the media save us? Don't count on it. Of the 2,975 questions directed to the candidates for president in early 2008, just six mentioned the words "global warming" or "climate change," the greatest policy challenge facing America. To put that in perspective, three questions mentioned UFOs.

Today the world's major unsolved challenges all revolve around science. By the 2012 election cycle, at a time when science is influencing every aspect of modern life, antiscience views from climate-change denial to creationism to vaccine refusal have become mainstream.

Faced with the daunting challenges of an environment under siege, an exploding population, a falling economy and an education system slipping behind, our elected leaders are hard at work... passing resolutions that say climate change is not real and astrology can control the weather.

Shawn Lawrence Otto has written a behind-the-scenes look at how the government, our politics, and the media prevent us from finding the real solutions we need. *Fool Me Twice* is the clever, outraged, and frightening account of America's relationship with science -- a relationship that is on the rocks at the very time we need it most.

Fool Me Twice: Fighting the Assault on Science in America Details

Date	:	Published October 11th 2011 by Rodale Books
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From Reader Review Fool Me Twice: Fighting the Assault on Science in America for online ebook

Richard Derus says

#ReadingIsResistance to lies. The ones about science aren't far behind the whoppers the White House issued on Day 1 about the small crowds attending the inauguration. FOOL ME TWICE at Expendable Mudge Muses Aloud got 4+ stars when I first read it with a worried frown six years ago; now the stakes are huge, please please go and educate yourself before the Great and Powerful Oz blows smoke in your eyes!

Sandra says

I found this book of enormous personal help since I have been grappling with why, why, why Americans have become so rejecting of science and scientists and what this bodes for our future. Over-population, fuel depletion, global warming, environmental degradation and the takeover of our country (and other countries) by fundamental religious fanatics of various stripes is of enormous concern to me, and Shawn Otto does a phenomenal job of explaining exactly how and why that has happened, no holds barred. He provides a little mini-history of science, and the real philosophical underpinnings of the great democratic experiment that is/was America.

I keep hoping that if I read enough of this sort of thing, I will become clear-headed enough to take people on and become more effective in advocating for the things I believe in--wait a minute, that is exactly how NOT to proceed since it is BELIEF that is largely the problem--be able to better explain why the scientific method matters and why it is important that government policies be based on actual knowledge instead of ideology.

Unfortunately, while the author's analysis is spot-on (IMHO), it leaves this reader feeling very depressed about the future and our prospects for meaningful dialogue and change. I think things are going to have to get a lot worse before they get any better.

Leanna Aker says

This is one of the best books I have read in years, no joke. I am a science teacher, and continually shocked and frustrated by the number of students who say science is irrelevant to them.... Despite cool labs and structures I have in place. This book chronicles the aspects of loss of respect for science, including historical effects, religion, politics, psychology, rhetoric, etc. It is full of interesting ideas and anecdotes, and some suggestions for how to address (and not address) the problem.

I would recommend this book for anyone interested in science, and also open-minded folks who don't "get" science. While the viewpoint is clear, the author does not shove ideas in your face and expect you to believe them. Phenomenal book that I will likely read again very soon.

Bradley Jarvis says

"Fool Me Twice" provides a valuable perspective on the history of science in the U.S., in terms of how it's been perceived and used in shaping people's lives. Otto makes the case that now, more than ever, public policy depends on the reality-based understanding of the world that it is science's main job to provide, yet for several reasons it is being disregarded, demonized, and sabotaged. Meanwhile, much of the rest of the world is nurturing scientific inquiry and taking its insights seriously, putting the U.S. at a serious disadvantage in a number of critical ways.

Otto stresses that science is political because of the influence of knowledge on the balance of power, yet our politics is woefully uninformed by science. This wasn't always the case: our country was founded on the principle that unfettered pursuit and availability of knowledge by all of its citizens is the key to a successful democracy. Now, there are people trying to take away that principle, either for their own personal gain or because they simply don't acknowledge its value, and our democracy – along with much the world we have come to influence – is suffering as a result.

Science is an embrace of wonder at the Universe, yet it owes much of its success to paranoia and fear. The creation and proliferation of nuclear weapons in the middle of the last century is largely responsible for this. Suburbia and our interstate highway systems are direct responses to the fear of nuclear attack, and the early space program which put men on the Moon was a thin guise for the development of advanced weapons delivery technology. Because funding was assured, many scientists could avoid promoting science to the public and focus on their work. As a result of this history, the public came to consider science itself a threat, and a backlash ensued which is largely responsible for today's anti-science attitudes, and the resulting change in politics has left science both without its assured funding, and with scientists unprepared to develop alternatives.

Part of the backlash against science involved the embrace of postmodernism, which argues that reality is totally subjective. It had the effect of removing objective determination of facts from its critical role in policy debates, characterizing science as merely another source of opinion. As such, it became a commodity in a "marketplace of ideas," rather than being used as a way to judge ideas based upon objective truth. Because, by its nature, the results of science are independent of how people feel about them, and scientists are forced by their discipline to reveal sources of uncertainty in what they do, science finds itself at a competitive disadvantage against opinions that claim absolute truth and cater explicitly to people's desires and cherished beliefs.

Otto uses several case studies, including global climate change, which in the U.S. is still subject to "debate" while much of the rest of the world has moved on to grapple with this very real and existential threat. Powerful interests, notably the fossil fuel industry (whose power base is threatened) and religious zealots (who believe God would never allow an ecological disaster to occur, and distrust science because it disputes their view of the Universe's history), have sold the false notion that there is a lot of uncertainty in climate science's understanding of the role of greenhouse gases in changing the climate. Otto details a five step propaganda process used by climate change deniers and others to "manipulate democracy" toward their ends by sowing doubt in the science behind the facts that stand in their way and guiding policymakers to take the actions they prefer. They are abetted in this deception by a lazy press that refuses to accept responsibility for exposing facts and holding people accountable for lying.

The huge amount of economic, military, and political power wielded by the U.S. ensures that solutions to the vast array of problems facing our planet will not be solved without its leadership, or at least its assent, and

science is critical to finding and implementing those solutions. There are also great opportunities for future progress that science can inform and make a major contribution to.

Otto proposes that scientists must actively engage in policy debates with an emphasis on the process of science: how it creates knowledge. It is this process, and its usability by anyone, that can provide much-needed credibility for the conclusions, which otherwise are treated as competing opinions. Exposing people to the wonders of the Universe and the thrills of discovery achievable through science is also critically important, as it adds meaning through awareness, perhaps the greatest gift science can offer.

John says

Imagine if you will, a United States of America in which the Republican Party was extolling the virtues of scientific knowledge and its implications for American public policy, while the Democratic Party was seen as the one acting contrary to our best interests, woefully ignorant in current understanding of science; a most unlikely historical "fact" stolen from the pages of some vividly imagined, ornately written, steampunk science fiction novel. Impossible, you, the intrepid reader might say, or was it once, a most inconceivable truth? Surprisingly, many will be stunned to read that it was indeed the truth, in Shawn Otto's well-written polemical history on American public policy with respect to science; "Fool Me Twice: Fighting the Assault on Science in America". A book that I, as a science-educated Conservative Republican, regard as the best book I have read with regards to American public understanding and appreciation of science, especially with regards to shaping public policy. Shawn Otto, one of the founders of Science Debate, regarded by many as the "largest political initiative in the history of science", has written a book that should be required reading by all politicians, by the science-literate public, and especially by those most interested in the current dismal state of affairs that exists with regards to using science in making well informed public policy decisions by local, state and Federal governments within the United States. A book worth reading since its prescriptions may offer us the best hope of preserving our democratic republic via a science and technologically-literate political leadership.

Otto opens with a succinct introduction to the philosophy of science, and asks the rhetorical question of whether science is political via a succinct memoir recounting the birth of his organization Science Debate (Chapters One and Two), that he co-founded with several journalists and scientists, most notably, physicist Lawrence Krauss and film maker Matthew Chapman (great-great-grandson of eminent British biologist and geologist Charles Darwin). He demonstrates the substantial degree of interest shown by the Republican Party toward the natural sciences and technology by Presidents and senior political leadership for almost a century from the Civil War until the 1950s (Chapters Three to Five); an interest which was reflected in the party's popularity amongst American scientists such as the eminent astronomer Edwin Hubble, still remembered for demonstrating the universe's current expansion. A substantial expansion in American science and technology, driven by the atomic arms race between the United States, and first, Nazi Germany, later, the Soviet Union, and then, a decade later, the "space race" culminating in the Apollo Moon program, led to American science taking "a walk" from the American body public via the need to produce results (in other words, to publish or to perish) without any regard for public outreach, especially towards politicians. However, I think Otto points too much of the blame on scientists themselves, and in advocating Carl Sagan's importance as a science popularizer - in many respects, I believe Sagan's friend, Stephen Jay Gould was far more important - offering faint rhetorical echoes of two themes superficially treated by his Science Debate colleagues, the journalists Chris Mooney and Sheril Kirshenbaum, in their book "Unscientific America: How Science Illiteracy Threatens Our Future".

One of the most memorable sections of "Fool Me Twice" discusses the role of postmodernist thought, especially its emphasis on "relativism", in accounting for increasing American antipathy toward science, despite technological successes like Apollo and the emergence of scientific "superstars" like astrophysicist Carl Sagan and Sagan's popular "COSMOS" television series (Chapters Seven and Eight). While others, including scientists like biologists Paul Gross - whom Otto notes as an important early Conservative critic of postmodernist thought's anti-science bias - and, most recently, Ken Miller ("Only A Theory: Evolution and the Battle for America's Soul"), have recognized this problem, only Otto has written here, in "Fool Me Twice", an extensive examination of its baleful influence on the American public's attitudes toward science, not only with regards to accepting biological evolution, but also, on issues like microwave radiation and the ongoing anti-vaccination movement; the latter especially prevalent within a substantial minority of self-described Liberal households with children ranging in age from infancy to early adolescence. Otto argues persuasively how postmodernist thought has crept into the Religious Right's objections to biological evolution - especially in the version of "scientific creationism" known as Intelligent Design - and in its opposition to global warming ("Chapter Ten"), and yet, as I have noted, Otto has spared no expense in condemning such thought as the philosophical rationale behind Leftist anti-scientific responses to vaccination.

Some Conservatives may ignore Otto's book, given its substantial anti-scientific orientation against 21st Century Conservatives and Republicans, but that orientation is quite sound, due to their embrace of Intelligent Design creationism and rejection of anthropogenic global warming. However, much to my amazement, Otto hasn't cited from the likes of Charles Krauthamer, George Will and John Derbyshire, their harsh condemnations of Intelligent Design creationism and ongoing efforts by Intelligent Design advocates to have "teach the controversy" laws passed in state legislatures. Nor the eloquent arguments made by Conservatives like Larry Arnhart, and especially, the well known skeptic Michael Shermer ("Why Darwin Matters: The Case Against Intelligent Design"), why it makes ample sense for Conservatives and Republicans to accept Darwin's theory of evolution via natural selection, since Darwin was inspired by Adam Smith's free market economics to envision his "economy of nature". Otto could have also emphasized some interest within the Religious Right in hearing pro-science messages from physicist Lawrence Krauss and biologist E. O. Wilson; however, instead, Otto offers the reader only the future prospect of ecological doom as a credible possibility ignored by some intransigent, quite zealous, Conservative clerics and scholars, such as Fundamentalist Protestant Christian evangelist Charles Colson and Orthodox Jewish religious studies professor Jacob Neusner ("Chapter Eleven"). Nor do I agree with his wholesale condemnation of Conservative talk radio, especially when there are programs like the John Batchelor Show, that try their best to be both informative and objective, as well as the mainstream media's reluctance in emphasizing the reality of our ongoing war against Islamofascism, or in investigating the "spontaneous" origin of the Occupy Wall Street movement and its ties to the Radical Left. And yet, these omissions do not detract from the overall excellence of Otto's book and of its dire warnings with regards to current and future American public - and especially, political - interaction with science, since our failure to heed them may mean the end of our two and a quarter centuries-old democratic republic. Americans, both Liberals and Conservatives, Democrats and Republicans, need to become conversant with science; "Fool Me Twice" is merely a most auspicious beginning in demonstrating how.

(Reposted from my 2011 Amazon review)

Amy L. Campbell says

Note: Received free advance reader copy from FirstReads program.

This book explained so much to me about why the American political system is stuck in rhetoric and unwilling to base decisions on fact and sound judgment rather than political platform or party byline. Otto outlines several factors for the degradation of respect for science including science itself due to a lack of focus on outreach and mishandling misinformation and mistakes that were published. Other culprits include sloppy journalism with it's efforts to present both sides of a story rather than attempting to determine what the facts of an event actually are, but then Otto also points out that the government was responsible for deregulating the news, thereby shooting themselves in the foot and allowing new sources to rely on hearsay as long as the perspective was "balanced."

While Otto does indicate that authoritarian Republicans (i.e. those relying on the Authority of the Bible and/or their party to make political decisions for them) are a major factor in the scientific assault, he also states that postmodernism is a major culprit. The idea being that if everything is subjective (as postmodernism indicates), nothing can be objective, and therefore science as the epitome of objectivity (meaning we can all observe certain phenomena or facts about the way things work) does not exist and/or is a form of oppression inflicted by the dominant culture.

Otto does offer some means of correcting the problem, namely by asking scientists to reengage with the world and politics and start educating the public. This book is a necessary read for anyone who teaches, votes, and loves liberty and reason. We HAVE to get away from just relying on other people to tell us how to vote and get back to being well informed citizens, reliant on our own knowledge to determine what is best for America.

Nancy says

The author identifies three anti-science movements -- religious fundamentalism, vested business interests and postmodern identity politics. With enemies on all sides, no wonder science is in trouble.

Otto includes suggestions for engaging various anti-science advocates but this is not a book that would appeal to (or convince) someone in any of three groups mentioned above. Hopefully more scientists will reach out as sales representatives for the scientific method and for the science behind the issues where the press is playing up the "controversy" long after the science is settled. I wish the book had focused more on "fighting the assault on science" rather than primarily on the history of the assault.

While packed with good information, I felt like I was slogging through some chapters because it would be good for me. Other sections really pulled me in. Don't give up if you get to a weak section.

Keelan says

This book should be mandatory reading, especially during the current election season. I could only read this

book in small doses because the portrait it paints for America's future is a bit discouraging, and I needed time to really think about what I was reading. The book is written with a sense of urgency, and at times I felt as though the author was almost desperate to connect with the reader, to demonstrate how very serious things are getting in American society. The book has been researched so thoroughly and written so well-it is riveting. The author examines how the scientific process and analytical thinking are under attack (and have been for some time), and ultimately what this means for the ability of our government to function effectively. America is trending downward in many areas and the author argues that in order to reverse this trend, there will have to be a sea change in the way people think about the role of science in policy-making. Science and technology impact every area of our daily lives from communications to national defense to transportation to food to healthcare, and yet there are only a handful of scientists in Congress. Compare this to China (in 2011) where 8 of the 9 members of China's top Communist Party leadership are engineers, and the other one is an economist. Americans, in general, discount the important and critical role that science will play in the future of America and its relationship with the international community. The book examines the historical context that helps explain the prevailing attitudes towards science and the scientific process (fascinating), and it offers a glimpse into what the future might look like if the status quo remains unchanged (chilling). This book represents a call to action not just for scientists, but for anyone who believes that reason and knowledge should be the standard by which legislation is drafted, rather than emotions and opinions.

Genine Franklin-Clark says

Wow. This book is so worth reading. Told from a scientist's perspective, it informs about a wealth of subjects, all linked, giving evidence for claims, describing why we have become so anti-science, (scientists are largely to blame)and offering concrete, rational solutions to the problem.

I urge everyone to read it, whatever your political or religious leanings. It makes sense. How often do you get that?

Steve Van Slyke says

This is an important book for anyone who loves science. As one who shudders when he hears beliefs put forth as facts, and scientific theories described as unproven alternatives to equally viable answers, it is comforting to read such a well-reasoned and clearly written defense of the scientific process and the knowledge that it provides.

But at the same time it is depressing because it is hard to argue the author's conclusion that the USA is, and has been for some time, on a downward slide from the top rank of countries in terms of its leadership in science education, respect for scientists, and its trust in reason over faith and opinion.

He discusses how journalists over the last several decades have dropped the ball in their responsibility to inform the public based on knowledge rather than opinion. Perhaps it's a generation-gap issue for me, but I somehow missed the whole post-modernist idea that it is only fair to give competing ideas equal weight even if one is based on hard-won, experimentally determined facts while the other is nothing more than the opinion of an ideology. Maybe that's why it seems to me that journalists today, particularly the mainstream variety, are afraid to really tackle sensitive but hugely important topics such as human population growth and its effects.

Here's one of many great quotes:

“If knowledge does not have primacy in public decision-making, then no truth can be said to be self-evident and we are left with the tyranny of ideology enforced by might.”

I found enlightening his description of why Al Gore's documentary/book, “An Inconvenient Truth,” not only failed to sway conservatives, it hardened their positions. The author says, “If you want to get people to vote against something, particularly Republicans, you need to get them angry about it, not scared of it, and if you want them to vote for something, you sell them hope and freedom.” He adds that you need to make science the answer, not the messenger, and avoid using a partisan political figure as the spokesperson.

His discussion of Garrett Hardin's concept the, “tragedy of the commons” was similarly instructive. We are no longer in an age where one more smokestack or one more high-tech tuna boat won't make an impact on the “common property of humankind.” I am appalled at the stupidity and/or greed of politicians and those who voted for them who fail to understand this.

“In a capitalistic and democratic system, my freedom to do as I wish is moral and just to the degree that it does not reduce your freedom to do the same.”

Perhaps I should not care because in one sense I have no dog in this hunt (no children), and yet I do care and this book only increased that feeling.

Andrew says

[This review is based on an Advanced Uncorrected Manuscript copy]

From the continuing battles over the teaching of evolution in our schools, to those politicians that deny the validity of the scientific evidence of global climate change and to the celebrities that continue to publicly support the idea that vaccines are linked to autism in spite of the lack of supporting evidence, it seems that science is under attack from all sides. Science, it is argued, is no longer the solution, but part of the problem. Science is expensive and we need to cut research funding to pay for other, higher priorities. Anyone who pays any attention to the media has seen at least some of these messages.

This book provides some insights into the relationship of science and American freedom and democracy, traces the history of various anti-science forces, and discusses why the responses of the scientific community have been inadequate to reverse the anti-science trend. While it starts out with an overly combative tone in the first section (to the point that I almost put the book down in disgust), it quickly corrects itself, and the following sections provide a clear analysis of how the enlightenment and science formed the basis for the American experiment in democracy from the very beginning and traces the history of the battles between science and a range of anti-science forces in American history.

After establishing how we arrived at the current situation, where those that don’t like the conclusions presented by scientific evidence feel free to simply ignore the evidence, the author then explores the reasons why the attempts to counter these reactions have, thus far, proven ineffective. The exploration of the psychological mechanisms of belief and authority help shed light on why the doomsday warnings about ignoring climate change only seem to make those that refuse to believe in climate change more resistant to the evidence. This same section provides specific suggestions that might provide more effective ways to

address the concerns of these people, allowing for a more rational debate and increasing the likelihood that a meaningful agreement might be reached.

This is an important book for anyone who is concerned by the anti-science climate that pervades the American culture today. It sheds light on how we got here, and provides new insights into ways that we can try re-establish science as the basis for increasing American freedom and for providing a solid foundation for the future.

David says

This is an excellent book about the attitude toward science in America. Both Thomas Jefferson and Benjamin Franklin strongly believed that science and knowledge are important to democracy, and Timothy Ferris, in his book The Science of Liberty: Democracy, Reason, and the Laws of Nature showed how important democracy is to the development of science. However, more and more in our society, science is either ignored or even assaulted on many fronts.

The media do not do a good job in presenting the facts. Journalists believe that their job is to "present both sides of a story", even when there really is but one side. Any dissenter, it is believed, no matter how small a minority he represents, must get his share of time arguing "his side". This is particularly true for science-related issues. The reason is that science is generally inductive, and therefore it doesn't "prove" anything, it just points the way toward probable explanations.

Shawn Otto does a good job at explaining the so-called "climate-gate" email scandal in the UK. The relevant e-mail is perfectly innocuous. People have taken the so-called data "trick" (that actually helps to make the findings more objective, in light of the poor correlation since 1980 between tree-ring data and temperature) and made it into a subversive hiding of the truth.

The book covers many of the contemporary political issues that are informed by science. Global warming is a big issue, discussed at length in the book. He shows that when it comes to this issue, the popular book by Levitt and Dubner, SuperFreakonomics: Global Cooling, Patriotic Prostitutes And Why Suicide Bombers Should Buy Life Insurance, is pure drivel. And their purported solution for global warming--injecting the stratosphere with sulfur dioxide aerosol--is a disaster waiting to happen.

The book would be helped if the author included some graphics; at times, Otto describes things in words that a diagram would have made clearer. The last several chapters of the book become somewhat preachy, but this may be a good thing. We need more voices like Otto's, to show how we ignore science at our own risk.

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masttek says

Some choice quotes:

The larger issue is that science is walled off form the general population, a subject left to experts, science museums, universities, and the odd science festival. It has become commoditized and the public is merely presented with the conclusions and not exposed to the process. And in its absence, other powers have rushed

in to fill the vacuum in the public dialogue, making science into their whipping boy when its conclusions don't support their ideological predilections. This is the problem science debates love: by putting science in its rightful place as an ongoing part of the police discussion of the nation, parents can become educated in the context in which they are used to taking in information--policy discussions that affect their lives. -p 293

Espousing the anti science argument, that the lack of absolute certainty that something is true is grounds for inaction or doubt, or that we should hear out all perspectives equally, is evidence of either a lack of understanding of reason or motivation by an unreasonable agenda. Such people should not be trusted with making decisions that will have serious impacts upon others. -p 279

"When a person holds a belief, especially a strong one that is linked to important values (e.g. some sociopolitical beliefs), information threatening that belief creates inconsistency in the cognitive system that threatens one's self-image as a smart person. This produces an unpleasant emotional state." That belief resistance--and this is a critically important point--is largely coming from the adult ideological worldview. This is why education is political in the first place, and why the children of scientists are the most likely next generation of scientists--and effect that is slowly striating society into knowledge haves and have nots and can only increase partisanship along science lines. -p 291

Science is atheistic in the sense that plumbing is atheistic. It limits itself to the study of natural causes. -p 185

In the end this is what matters most: the beauty. It's why scientists do science: to apprehend the great beauty of nature. They are Puritans, four hundred years hence, with more data, but still searching for that direct communion with wonder an the aesthetic. In this way science is not unlike art or religion. In fact art often anticipates and reflects the forms science discovers, as does religion. Science is much bigger than just solving challenges, as important as they are. It is about who we are as human beings, about or ability to love, to wonder, to imagine, to heal, to care for one another, to create a better future, to dream of things unseen. -p 308

Alison Coe says

While I think this book intended to have a good message that all people should know of before the next election, it just isn't written for the masses. It is dry, terribly organized, and just very dull. As a scientist I found that this should have been tailored to the general masses who may not realize that this is a problem rather than the persons in the scientific community who know all too well this problem exists.

Kyle Worlitz says

This may be the biggest problem facing America today. Anti-science crazies have hijacked a large percentage of public discourse. One of the reasons I'm in education.
