

The war on truth

The War on Science: Who's waging it, why it matters, what we can do about it

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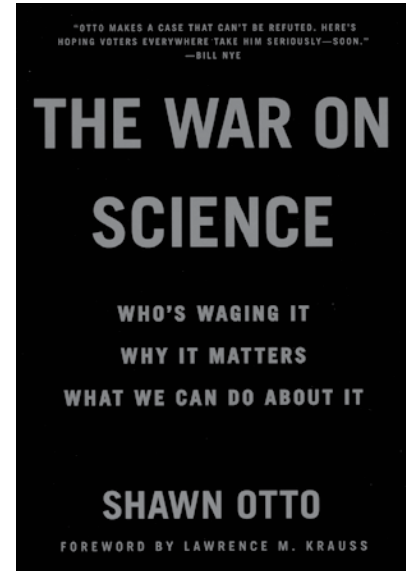
Andrew Kulikovsky

Shawn Otto is a science writer, novelist, film-maker and 'Green' activist. He believes there is an orchestrated war on science: "A vast war on science is underway, and the winners will chart the future of power, democracy, and freedom itself. This book is an account of that war, and what we—concerned citizens of all political persuasions, in all countries—can do to win it" (p. 10).

The book has a foreword by atheistic cosmogonist Lawrence Krauss, and a front-cover blurb by Bill Nye, who once acted as 'the Science Guy' on children's TV.

According to Otto, the war on science is coming from both the political left and right, but he believes the right—a coalition of fundamentalist churches and corporations largely in the resource extraction, petrochemical, and agrochemical industries—is largely anti-science and has far more dangerous public policy implications because good policy is being inhibited by a desire to protect destructive business models.

Otto asserts we have an unsupportable population that is destroying our environment, and the developing world is adopting the same unsustainable development model. However, he claims: "Political and religious institutions are pushing back against science and reason in a way that is



threatening social and economic stability" (p. 7).

Manufactured controversy?

The author claims that 'establishing a controversy' is the most common aspect of modern anti-science attacks "because it takes advantage of the reasonable sounding but incorrect idea that a 'healthy debate' reveals the truth. When such a debate pits knowledge against a passionately articulated opinion, the opinion often wins" (p. 19). Otto questions whether there really are two sides to every story, and suggests alleged controversy is an invention of journalists trying to find an angle in order to get a headline. For Otto and other scientific rationalists, one of these conflicting claims can be shown to be objectively false, and it is irresponsible reporting to present a controversy when none exists. But denying or refusing to account for inconvenient facts does not make them disappear and scientific issues are all too often decided by a 'preponderance of opinion' rather than evidence.

In Otto's mind, science is based on "... accumulated knowledge gained from tens of thousands of painstaking experiments done by thousands of scientists working over fifty years taking and reporting on billions of measurements reproducible by others, as in the case of climate science, and the other side is a persuasive opinion articulated by a passionate advocate who is intent on convincing viewers of the rightness of his or her perspective, by presenting them as a debate ... presenting them to the public as if they had equal merit with tested knowledge" (p. 23).

The author basically wants journalists to only report the current scientific consensus, but science is not a democratic process. Many measurements and observations are not repeatable because they were done in the past—this is especially the case in 'climate science'. And much analysis cannot be reproduced because many climate scientists refuse to release their data and source code used to normalize and analyze their data.

Otto argues that allowing the teaching of alternative theories on politically contentious topics like evolution, climate change, or birth control in science classes is damaging children's ability to learn critical thinking. However, the very opposite is the truth. Being taught only one view is to be taught what to think, rather than how to think. If the evidence is so one-sided as the author claims then why not present all the arguments and evidence for both sides? This is the only way to effectively develop critical thinking skills. However, for scientific materialists like Otto, nothing must ever be allowed to call into question the current scientific dogma.

Otto asserts that there is "no scientific controversy about the theory of evolution" (p. 27), but this is because evolution is not science! If we allow different views in relation to evolution, students would

be introduced to Jonathan Wells' *Icons of Evolution* which exposes the vacuousness of the evidence supporting it.¹

If we allow different views in relation to the effectiveness of sex education, students would be told about recent peer-reviewed studies of sexual and reproductive health educational programs that found no evidence of improved health outcomes. In one study the authors concluded—after examining the actual biological outcomes rather than mere self-reporting—that "the educational programs evaluated had no demonstrable effect on the prevalence of HIV ... or other STIs [Sexually Transmitted Infections] ... There was also no apparent effect on the number of young women who were pregnant at the end of the trial."² Other studies have made similar conclusions.³

For Otto, teaching the controversy regarding evolution suggests there is a legitimate scientific controversy when, in Otto's opinion: "There simply isn't. Evolution is the most well supported knowledge in science" (p. 216). But this claim is laughable. As Jonathan Wells has shown, the iconic evidence for evolution is a mirage.¹

What is science?

According to Otto, the very essence of the scientific process is to question long-held assumptions about the nature of the universe, to design experiments to test those assumptions, and to acquire knowledge that is independent of our beliefs, assumptions, and identities, based on our observations. This knowledge is asserted to be independently verifiable and objective. Otto argues that scientifically testable claims are transparent and can be shown to be either most probably true, or false, regardless of who made the claim. "Because it takes nothing on faith, science is inherently

antiauthoritarian, and a great equalizer of political power" (p. 45).

Otto believes science is conservative because "it is retentive of knowledge and cautious about making new assertions until they are fully defensible" but also progressive because it is "open to wherever observation leads, independent of belief and ideology, and focused on creating new knowledge" (p. 84). This conception of science and scientists is completely divorced from reality and is, at best, breathtakingly naive. At worst, it is utterly delusional, as will be shown below.

The author describes the scientific method as a collection of techniques—including observation, inductive reasoning, hypothesizing, prediction, experimentation, recording, critical peer review, and replication—used to objectively measure things in the real world in order to acquire reliable knowledge independent of our perspectives. He explains that 'objective' means "stripped of personal, religious, political, emotional, cultural, sexual, referential, and other biases, which is what the process of science works to achieve via repeated testing, confirmation, and peer review" (p. 163).

Furthermore, scientists are concerned with evidence, falsifiability (vulnerability to disproof), and defensible statements. Again, Otto holds the naive view that scientists seek "to draw and defend conclusions supported by observational evidence but testable by anyone ... scientists speak in terms of the preponderance of the evidence, and in terms of disproof" (p. 179). As Karl Popper wrote: "the criterion of the scientific status of a theory is its falsifiability, or refutability, or testability ... A theory which is not refutable by any conceivable event is non-scientific. Irrefutability is not a virtue of a theory (as people often think) but a vice" (pp. 234, 235). So for Otto, if there is no

possible way to prove a hypothesis is false then it is not science and it cannot produce any real knowledge. However, he seems completely blind to his own assumptions about ‘scientific truth’. What scientific test would invalidate evolution? What scientific test would invalidate radiometric dating? What scientific test would invalidate catastrophic anthropogenic global warming? By Otto’s own standard, none of these things that he considers to be absolute, settled, scientific fact are actually scientific!

Otto claims geological measurements show consistently that the earth is about 4.54 billion years old based on the uranium-lead and potassium-argon radiometric dating methods and what he describes as “simple math”. But Otto’s claim is false. Results of radiometric dating are not always consistent, and the methods suffer from several methodological problems. The initial amount of parent and daughter isotopes cannot be measured and must be assumed. Nor can the presence and magnitude of any contamination be measured. In addition, there is no way of knowing whether the decay rate has always been constant. These problems can all greatly inflate the ages derived from these methods. Indeed, many, many anomalous dates have been calculated. Although scientists routinely explain away these anomalies, the explanations are always *ad hoc*. As John Woodmorappe has pointed out, scientists credit dating methods for assumed successes, but blame nature for obvious failures. They also appeal to marginalisation and technicalities to reject inconsistent or ‘inconvenient’ dates.⁴

Otto ignores the Christian epistemological critique of science, where science is by definition only concerned with the material world. By definition, science leaves no room for the operation of the supernatural and the acquisition of knowledge by divine revelation. As a materialist, he



Figure 1. Michael Polanyi’s books *Science, Faith and Society*, and *Personal Knowledge* expose the myth of objective, empirical science: all knowledge claims rely on personal judgements.

is committed to logical positivism and argues as if Michael Polanyi (figure 1) never existed. Polanyi argued that positivism is inadequate because it assumes the ‘knower’ knew without actually being there—it does not take into account the knower’s ideas or presuppositions. Positivism assumes that the knower approaches everything without any presuppositions or assumptions, without any grid through which he feeds his data. But this is simply not true. All scientists feed their data through a grid that filters what they see and find. There are no totally objective observers and science cannot exist without observers. Therefore, Otto has no basis for knowing within his own philosophic system. In other words, he accepts science with no epistemological base. He is operating on faith rather than facts.

Unsurprisingly, the author places great faith in peer review. He naively believes that if peer reviewers discover any holes in the methodology, it gets sent back to rework, but if they conclude that it is solid and transparent enough to state their reputations on, it is recommended for publication. But as I have shown elsewhere, this is not even remotely close to

how the process works.⁵ Indeed, in a subsequent chapter, Otto points to Wakefield’s 1998 publication in *The Lancet*, a scientific paper that linked measles, mumps, and rubella vaccines to autism. Wakefield became a media star but it was later discovered that he had doctored his evidence to fit his *a priori* conclusion. The paper has since been discredited as fraudulent and withdrawn by the journal. But this raises the question of the quality and objectivity of the peer review process which the author had previously lauded as ensuring the highest quality of scientific research.

History of science

Otto attempts to inflate the contribution of Islam to science and asserts that Islam was the keeper of scientific knowledge during Europe’s ‘Dark Ages’. He refers to Ibn al-Haytham (AD 965–1040) and his work *Optics* as developing an early concept of the scientific method, and Musa al-Khwarizmi and the House of Wisdom in Baghdad as developing their own science in a range of fields. Regarding al-Haytham, as a youth, he explained in his autobiography that he thought the conflicting religious views of the various religious movements lead to the conclusion that none of them represented the truth. He became increasingly unhappy with his detailed studies of religion and made a decision to devote himself entirely to a study of science which he found most clearly described in the writings of Aristotle. Regarding the House of Wisdom, its main project was collecting and translating classical Greek literature and many works were borrowed from libraries in the West. Moreover, it attracted scholars and scientists, including Christians, from all over Europe and the Middle East to take part in their work.⁶

In any case, the popular negative perception of the ‘Dark Ages’ is

mythical. Respectable encyclopedias such as the *Columbia Encyclopedia* and *Britannica* reject the term. During the so-called Dark Ages, Europe made great technological and intellectual leaps in agriculture, engineering, and manufacturing.⁷

Unsurprisingly, Otto uses the Roman Catholic Church's treatment of Galileo in 1633 to claim that the church denied the validity of astronomical science by indicting Galileo "for the heresy for [*sic*] simply describing what he found by observing nature" (p. 61). One obvious difference is that Galileo's observations were in the *present*, while evolution is a claim about the *past* and climate change concerns the *future*. For Otto, Galileo's observations were categorical proof and "obvious to anyone who wanted to look through Galileo's telescope" (p. 44). However, as Schirmacher has pointed out, the idea of Galileo as a heroic scientist standing up to the narrow-minded dogmatism of the Catholic Church is a complete myth.⁸ Suffice to say that Galileo was in conflict with Aristotelian scientists not the church, and Galileo's observations did not prove heliocentrism. The scientific evidence *available to him and his contemporaries* was equivocal.^{9,10} The final proof (stellar parallax) was not found until 1838.

Otto objects to Thomas Kuhn's argument that science was not a gradual and painstaking accumulation of knowledge, but advances through sudden paradigm shifts. The author believes Kuhn cast science as an expression of politics and power because he documents how proponents of the prevailing paradigm continue to support it despite contrary evidence and new discoveries. According to Otto, Kuhn's error was to intertwine the politics of science and the discovery of truth, but the two are intertwined. Scientists are human beings with egos and reputations. Their careers are dependent on

publication and acceptance of their work. Standing against the prevailing paradigm is a first-class ticket to killing one's career. Yet Otto naively believes that if a new discovery better explains things, "the scientific community is all over it" (p. 182). This is a misreading of Kuhn. The scientific community will only reject the prevailing paradigm if contradictory evidence is overwhelming, and a new and better ideologically acceptable paradigm is ready to replace it. Contra Otto, Kuhn was not suggesting there was no objective truth, only an endless regression of subjective ideas. Kuhn was merely describing the path to discovery of objective truth as revolutionary rather than incremental.

Opinion vs science

According to the author, from the late 1990s onwards, non-scientists are increasingly unable to discern between knowledge and opinion. He complains about the Federal Communications Commission in the US abolishing the fairness doctrine where television and radio programmes must present controversial issues of public importance in an honest equitable and balanced manner. Those in favour of the repeal argue that market forces will result in competition in the marketplace of ideas which will stimulate broad-ranging and high-quality discussion. But in Otto's opinion, the opposite has occurred with discussion becoming less diverse and more polarized, and he points to the complete rejection by many people of climate science as a manufactured political project of socialists bent on a global takeover and government-funded scientists who enable them.

Otto rejects the notion of a 'marketplace of ideas' and that media organizations with a variety of viewpoints will compete to deliver the highest quality journalism at the best price. For Otto, journalism's function

in a democracy is to tell people what they do not want to hear but need to know anyway—the clear implication being that journalism should serve the government and/or media organisations to deliver the prevailing views and consensus opinions of their masters. Contrary ideas and views are mere emotional responses.

That Otto is against debate is demonstrated by his reference to Lawrence Krauss's comments on presidential candidate Pat Buchanan professing to be a creationist:

"[There is] a growing hesitancy among both journalists and scholars to state openly that some viewpoints are not subject to debate: they are simply wrong. They might point out flaws, but journalists also feel great pressure to report on both sides of a 'debate'" (p. 160).

For Otto, the materialist scientist should be the only voice in the public square:

"When a television news program presents a split screen with a scientist on one half representing the knowledge accumulated from tens of thousands of experiments performed by thousands of scientists, and then presents a charismatic advocate with an opposing opinion on the other half, as if the knowledge and opinion carry equal weight, this creates false balance" (p. 165).

In fact, the author routinely presents those who disagree with the current scientific consensus as being anti-science.

Despite condemning the dressing up of opinion as science, Otto repeats the '97% of scientists agree on climate change' claim, which is ultimately a political rather than a scientific argument, and, in any case, the claim is false.¹¹

Evolution

Otto asserts that evolution "has nothing to do with belief or political

correctness; it has to do with evidence from observing nature ...” He adds:

“Modern medicine and biology are based on evolution Evolution is the most fundamental principle in biology, the one that unified it into an organized science. Without the theory of evolution, there would be no biology and no modern medicine. It connects and provides a framework for understanding all the disciplines within the life sciences, from genetics to virology to oncology to organic chemistry” (p. 212).

But Otto’s argument is based on equivocation: by ‘evolution’ he is actually referring to mutations, natural selection, and genetic drift, not molecules-to-man evolution. But the occurrence of mutations, natural selection and genetic drift are not unique to the theory of evolution. Creationists have no issue with any of these. They do not and cannot produce more complicated organisms.

Noting that creationists acknowledge the operation of ‘micro-evolution’—genetic variation within a species—but reject ‘macroevolution’—the gradual development of higher species from simple organisms, Otto cites Russian geneticist Dimitri Belyaev’s experiments on wild foxes beginning in the 1950s as having demonstrated macroevolution. But these experiments did nothing of the sort. The foxes remained foxes. They did not become something else!¹²

Nevertheless, Otto goes on to cite antibiotic resistance as proof of evolution: “We can see it working with our own eyes by watching viruses and bacteria evolve under the microscope. When one does, it becomes difficult to see how anyone could construe it as a matter of belief. It’s like saying, ‘I don’t believe in gravity’” (p. 218). But antibiotic resistance occurs not because of an increase in information but due to gene transference or mutations that destroy information,

causing a reduction in sensitivity to the antibiotic.¹³

Otto makes the presumptuous claim that top neurosurgeon Ben Carson (figure 2) suffers from confirmation bias and is unable to look at a problem from an evidentiary standpoint but instead seeks to find evidence that supports his Seventh-day Adventist faith because he believes the theory of evolution was ultimately inspired by Satan. Even if Otto was right about Carson, does he seriously believe that scientists who are materialists do not also suffer from confirmation bias and only seek evidence that supports their materialism? He also doesn’t explain how an anti-evolutionist could become a top neurosurgeon in the first place!

He goes on to state that science “doesn’t suggest order ‘just appeared’

out of nothing ...” (p. 211). Indeed, science doesn’t suggest this, but evolution does—because evolution is not science! He also argues that because cars are designed machines, they are not at all comparable to the processes of evolution. But the point is that although biological organisms are orders of magnitude more complex than cars, evolution posits that this complexity came into being by chance plus natural selection! Yet Otto naively insists that believing in evolution is “not an act of faith” (p. 212) because he (incorrectly) asserts it is supported by a “tremendous number of independent lines of evidence from a wide variety of scientific disciplines” (p. 212).

Otto also criticizes Michael Behe’s argument that many biological structures (such as the human eye) are

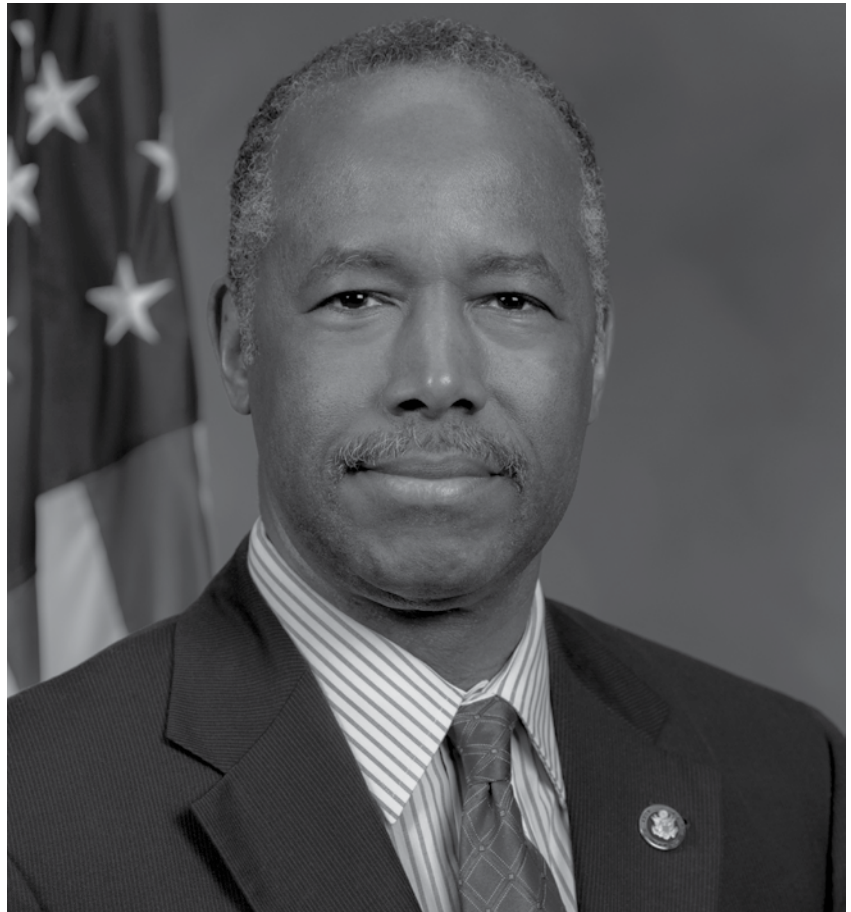


Figure 2. Otto attacks top neurosurgeon Ben Carson for his creationist beliefs, presumptuously claiming that his rejection of evolution is merely based on his faith rather than objective science.

irreducibly complex and therefore suggest Intelligent Design rather than random evolutionary processes. According to Otto, the eye is not irreducibly complex and “we can show with considerable evidence exactly how the eye evolved and is continuing to do so” (p. 221). His authority for this claim is another science writer, Carl Zimmer, but his claims are equally baseless.¹⁴

Otto claims the knowledge gained from evolutionary theory “helps us to be ... better computer programmers” (p. 213). As a professional systems and software engineer with formal qualifications in computer and information science and 25 years’ experience developing complex, real-time, safety-critical systems, I can assure you evolution has played absolutely no part in my work. In fact, the opposite is the case—systems are intelligently designed, not a result of haphazard or chance changes.

On accepting scientific truth claims

When it comes to persuading the public to accept the current scientific consensus, Otto suggests the problem may not be ignorance, but active ideological resistance. He notes that only 19% of college-educated Republicans accepted the scientific consensus on climate change compared to 75% of college-educated Democrats and concludes that Republicans’ rejection of the climate change consensus must be due to their political ideology. But this argument cuts both ways: Democrats may overwhelmingly accept the climate consensus because of their political ideology, e.g. because the solutions always seem to lead to more taxation and regulation, typically supported by Democrats. Alternatively, Republicans may have learnt critical thinking skills and understand that climate science is not based on empirical facts and evidence but Green ideology.

Regarding science education, the author writes:

“... we need to understand that some misconceptions about science are the result not of knowledge deficit but of belief resistance, and to devise ways to short-circuit these processes. That belief resistance—and this is a critically important point—is largely coming from adults. This is why education is political in the first place ...” (p. 244).

He goes on to claim that scientists are different from everyone else because they try to

“... set aside emotions, assumptions, and ideological predispositions and to adjust their worldview to a careful, detailed consideration of the evidence The desire for success in science instils the values of honesty and integrity, which are impossible to fully adhere to when making a rhetorical argument whose purpose is to win by a different standard” (p. 249).

But Otto’s characterization of science is breathtakingly naive, bordering on delusional. Scientists are not always objective. They have egos, and the possibilities of money, power, fame, and prestige, provide strong incentives to stick with and defend the consensus or else face isolation. There is in many ways a coercive consensus. Therefore, it is not surprising to find there have been many instances of scientific fraud.¹⁵ Indeed, Otto himself had already pointed to *The Lancet* publishing Wakefield’s fraudulent paper on vaccines and autism.¹⁶

Environmentalism and ‘climate science’

The author asserts that the modern ‘industrial complex’ is working to undermine scientific truth regarding the environment and climate in order to protect their massive industrial and commercial interests. The first example he offers is DDT, citing Rachel Carson’s crusade against the

insecticide on the basis that it allegedly caused systemic pollution, killed birds, and caused cancer in humans. None of this is remotely true as I have shown elsewhere.¹⁷ You can find old videos where people were sprayed with DDT, and the sprayers didn’t use gas masks, and suffered no ill effects. He adds that human-caused climate change has “profound existential stakes for the world’s most powerful industry (fossil fuels)” (p. 269).

Otto is clearly totally committed to the absolute truth of claims about anthropogenic global warming. He is convinced that thousands of scientists have measured and collected massive amounts of data using many different methods that all show increasing CO₂ levels have caused global warming and this could begin to “change climate patterns in ways that destabilise our economy, our national security, and social structures and our environment” (p. 271).

Otto claims that Michael Mann’s infamous ‘hockey stick’ graph was a categorical demonstration of the sharp increase in average temperature in the last half of the 20th century: “They represented classic observational empiricism. By proceeding logically from observations, they were able to create knowledge that could be tested and verified by others, which it was” (p. 296). He notes that Mann’s work has been severely criticized but dismisses the criticism as being motivated by interests other than the search for scientific truth. Mann himself has specifically pointed to a 2006 US National Academy of Sciences report that supposedly affirmed his findings.

But neither Mann nor Otto are telling the truth. Stephen McIntyre and Ross McKittrick have shown that Mann’s dataset “contained collation errors, unjustified truncation or extrapolation of source data, obsolete data, incorrect principal component calculations, geographical mislocations and other serious defects.” McIntyre and McKittrick used Monte Carlo

analysis (use of meaningless, random, test data) to demonstrate that Mann's defective data and unconventional methodology always generated a hockey stick graph! When these defects were rectified, Mann's own model "yielded a northern hemisphere temperature index in which the late 20th century is unexceptional compared to the preceding centuries, displaying neither unusually high mean values nor variability."¹⁸

In addition, meteorologist Hans von Storch, director of the Helmholtz Center in Hamburg and an IPCC lead author, has pointed out that the *National Academy of Sciences* report that Mann claimed supported his findings actually showed that Mann's methodology led to questionable historical reconstructions.¹⁹ As a result, the IPCC's Fourth Assessment Report (AR4, 2007) buried Mann's 'hockey stick' among many other projection curves, and the IPCC's Fifth Assessment Report (AR5, 2013) dropped it altogether. Thus, Otto's defence of Mann's work is misleading and not at all based on empirical, objective facts.

Otto dismisses claims by skeptics that there has been no warming over the last 10 years as a statistical trick used to fool audiences—"one of the most common tricks in science denial PR" (p. 300). He claims "one can pick *any* ten-year period and show no warming" (p. 300). However, the warming pause has actually lasted for more than 20 years. This has been confirmed not only in the UAH, Hadcrut4, and Hadsst3 datasets, but in the most accurate RSS satellite dataset. Otto is in denial!

He also appears to be blind in regard to scientific malpractice in the climate science field, including the modification and manipulation of source data.²⁰ Despite claiming that normal scientific practice allows other scientists to replicate scientific results, Otto ignores the fact that many top climate scientists have refused to make their data and models publicly

available, and asserts that attempts to obtain them through Freedom of Information laws are abusive and calculated to "harass and cripple scientists' operations, political reputations, professional focus, and relationships with their universities" (p. 318).

Conclusion

This book is full of false and misleading claims and bogus arguments. The author seems to believe that questioning the truth claims of scientists equates to the celebration of anti-intellectualism. In addition, his definition and discussion of how science operates, and its origin and history, are grossly inadequate and highly distorted. Moreover, the author is guilty of psychological projection: almost every accusation Otto makes against his opponents is just as applicable to him!

The book is an intensely ideological and political work that is uniformly critical of US Republicans, while praising Democrats. Indeed, the author expresses his elitist and authoritarian views when he asks "are the people still sufficiently well-informed to be trusted with their own government?" (pp. 11, 42).

Otto's aim was to demonstrate that there is a war on science, but his offering is merely a defence of scientific materialism and Marxist ideology. His work is effectively *a war on truth!*

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