

BOOKS

Complicating the Narrative

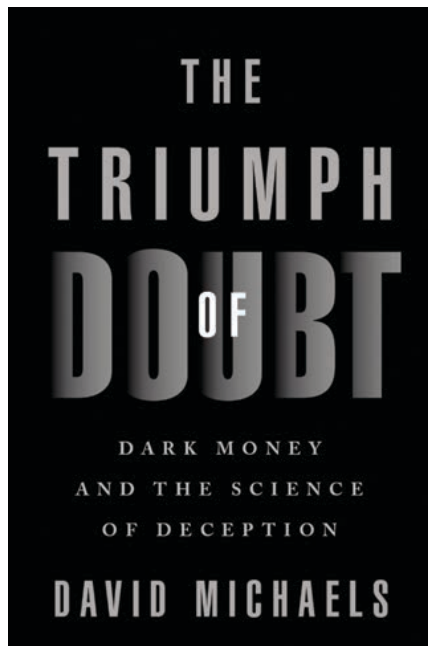
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Recent books by David Michaels, an epidemiologist and former assistant secretary of labor at the Occupational Safety and Health Administration, and Naomi Oreskes, a historian of science at Harvard University, address the role of science within the policy realms of public health, environmental protection, and worker safety. Both authors explore the basis for scientific authority and describe how special interests misuse scientific findings, processes, and methods to undermine policy implementation and regulatory oversight.

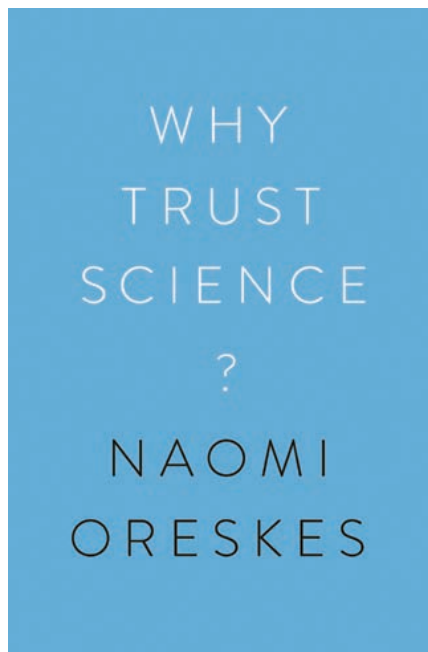
In *The Triumph of Doubt*, Michaels performs a public service by shining a light on the “product defense industry”: a well-established enterprise with a shopworn playbook and standardized modes of operation for protecting from regulation and litigation clients whose products or activities pose public health concerns. He demonstrates that this industry is the result not of the isolated actions of a few bad apples, but an entrenched cadre of what he calls “mercenary scientists.”

It’s useful to be reminded that tobacco companies, for instance, need more than access to tobacco, manufacturing facilities, labor, and far-flung distribution and retail systems; they also need ready-at-hand capability to forge and perpetuate doubt about the negative health implications of cigarettes. This book is clearly important, and the tactics and implied worldview of the product defense industry are galling and deplorable. As the consumer advocate Ralph Nader writes in one of the book’s dust jacket blurbs, the book should “grip you toward detection and defiance.”

Although Michaels’s depiction of various obfuscation campaigns is engaging, his book sometimes substitutes assertion



The Triumph of Doubt: Dark Money and the Science of Deception
by David Michaels. New York, NY: Oxford University Press, 2020, 344 pp.



Why Trust Science?
by Naomi Oreskes. Princeton, NJ: Princeton University Press, 2019, 376 pp.

for argument and adopts a tone that can be more shrill than thoughtful. He writes hyperbolically, for example, that an effort to “keep regulations at less protective levels” is “tantamount to ignoring ... health impacts ... altogether”; that particulates do not “lodge” in lung tissues, but rather “burrow into the recesses”; that substances are not “emitted,” but “billowed into the air”; and that members of the “free market ‘anti-regulatory’ movement are born wealthy but think of themselves as self-made.” And I’m sorry but, contra Michaels, honest, smart, God-fearing people can and do adopt divergent positions in the debate concerning whether policy formation should be driven by prudent anticipation of potential risk or hard-and-fast causal proof of harmful consequences. At some points, the book sizzles more than enlightens.

Perhaps as it should be, *The Triumph of Doubt* is one-sided. Few seasoned observers of contemporary American science policy believe that only people defending dangerous products are guilty of strategic framing and cherry-picking scientific outputs to defend or further a cause. But the book rests on a series of simplistic dichotomies between “dark” money and legitimate funding institutions; “conflicted” scientists working to undo the accomplishments of “independent” researchers; ethical and unethical operators; and legitimate and illegitimate journals. Is there nothing in between? As an example, I wish Michaels explored episodes such as how the lack of reproducibility in oncological research findings was surfaced by scientists working for the biotech giants Amgen and Bayer. When it comes to science in the world of policy, is there never room for honest disagreement?

Maybe my biggest peeve is that Michaels makes assertions such as “Science is supposed to be constant, apolitical, and above the fray.” He writes as if disciplines such as the history of science, the sociology of knowledge, and science

and technology studies—all of which recognize the nuance and complexity of scientific research—don't exist.

Not so with Naomi Oreskes. In *Why Trust Science?* she delves deeply into the epistemological foundations for scientific authority, providing a summary of seminal positions within the history of knowledge and philosophy of science. She finds that contemporary efforts to rattle the foundations of knowledge actually have roots in centuries of debate.

Building on the work of Helen Longino, a philosopher of science who defends the importance of values and social interaction in scientific research, Oreskes argues that “science is fundamentally consensual.” She dissects five episodes of science-based assessment (limited energy theory, continental drift, dental floss, eugenics, and hormonal birth control and depression) to demonstrate that the credibility of science results from a convergence of factors: consensus, method, evidence, values, and humility.

Although locating the source of science's intellectual authority in its open, transparently critical, nondogmatic mode of social interaction, Oreskes nevertheless uses language associated with the era of classical empiricism. For instance, she refers to legitimate scientific outputs as “objectively true” and “established facts.” As she writes, “Some people worry that overconfidence in the findings of science or the views of scientists can lead to bad public policy. I agree: overemphasizing technical considerations at the expense of social, moral, or economic ones can lead to bad decisions. But this does not bear on the question of whether the science involved is right or wrong.” I don't completely agree. The outcomes of policy science assessments are never simply matters of “established fact.” Although constructed from scientific data and methods, they are always judgmental constructs.

Michaels and Oreskes both use the term “manufacture” as a trope to help illustrate and carry their arguments, speaking of the “manufacture” of doubt

and uncertainty by those who would benefit from such doubts. I argue, instead, that the deplorable campaigns of R. J. Reynolds (defending tobacco use), Purdue Pharma (promoting addictive opioids), and the Volkswagen Group (cheating on emissions tests) gain traction partially because of widespread misunderstanding of how the methods and outputs of science are used in the policy context. These misconceptions are common among the media and lay public, but are perpetuated by scientific elites. I suggest that craven efforts to enrich selected clients through public endangerment may be enabled because people such as Michaels and Oreskes continue to use words such as “objectivity” when they discuss the role of science in regulatory policy.

In the policy context, scientific assessments address highly complex, multidisciplinary phenomena. These might include changes to the global atmosphere, mixed-use management of resources on public domain lands, or total maximum daily loads of pollutants to estuarine systems such as the Chesapeake Bay. Issues such as these cannot be characterized in terms of one or two variables of concern. Instead, they involve the integration of dozens of data sets, application of numerous models, and findings from perhaps hundreds of studies. These assessments bear little resemblance to high school science class exercises.

Over the past four decades, government scientists have worked with academic researchers and scientific institutions to evolve a process known as “weight-of-evidence” assessment. Under this approach, regulators consider all relevant information, taking into account the strengths and limitations of available models and data, and then explain how the various types of evidence fit together. Regulatory agencies document these analyses in exhaustive reports, sometimes called “criteria documents.” These reports are available to the public and reference all publications, studies, and data sources considered; describe key procedures used to prepare the assessment; outline peer

and public review activities; and identify key assumptions, reference values, and analytical parameters. This process meets requirements that are articulated in federal statutes, is fully consistent with the Administrative Procedures Act (which governs how federal agencies enact regulations), and has been validated through numerous state and federal court cases.

Science does not provide “right answers” for public policy so much as help furnish and bound a plausible solution space. However, the resultant solution space will—indeed, must—be colored by ethical precepts, public values, assessments of technological feasibility, estimates of economic costs, institutional charters, legal stipulates, available resources, and the cultural and epistemic frameworks of stakeholders and policy targets. Health and environmental policies, then, are stories, and the value of any given “piece” of scientific input depends at least as much on its role within the narrative as it does on considerations such as statistical power.

Science policy assessments are synthesizing activities. The strength of the resulting policy is a function of factors such as overall coherency, plausibility, and consistency of outcomes with technical inputs. It is absurd to argue that a complex policy such as an Environmental Protection Agency Registration Eligibility Decision can be invalidated because a particular scientific characterization is somehow open to question. Only through consideration of the overall narrative can we warrant the reasonableness of component scientific inputs.

As I read them, both authors continue to promulgate the old saw that science possesses an authority that can be used to direct, ground, or underpin policy decisions. We need to stop talking that way. Good policy results from a *mélange* of sound reasons for taking an action. As the political scientist Giandomenico Majone puts it: “The structure of [a policy] argument will typically be a complex blend of factual statements and subjective evaluations.... This unavoidable complexity makes any direct, informal testing of the argument quite impossible. Whatever testing is done must

rely on a variety of standards that depend on the analytical methods employed, on the plausibility and robustness of the conclusions, and on agreed-upon criteria of adequacy and effectiveness.”

Again, policy-making is an exercise in judgment. Does that mean that it’s okay to concoct fake science? Of course not; that would be dishonest. But we should stop trying to convince people that good science can somehow enshrine a policy with “objectivity” or “validity.” We should instead remind people that the role of the discerning citizen requires critical reasoning across a wide range of considerations, perspectives, value judgments, and disciplines.

Why Trust Science? has an engaging interlocutional format, unfolding through a kind of dialectical exchange between Oreskes and a diverse group of commenters. One of her commenters—the social psychologist Jon Krosnick—observes that contemporary science suffers from “numerous inefficiencies ... across many disciplines” and needs “dramatic reform.” Krosnick, in other words, does not share Oreskes’ faith in the self-reformative power of scientific interaction, observing that it is hard to imagine a scientist who is not subject to some type of extra-scientific motivation, including ambitions to become famous, win grants, get tenure, and be paid well. Writing in the Spring 2020 issue of this journal, the social scientists Stephen Turner and Daryl Chubin argue that “scientists are not free agents, but are part of a demanding and constraining system”; driven by quantitative accountability, this system “invites cheating, crowd-following, lapses in quality, and subservience to sponsors.” In other words, dicey science can come from anywhere.

Nuance and critique aside, I found myself mulling how committed Donald Trump voters would respond to either of these books. Would they buy one, would they finish reading it, would it change their thinking and make them more discerning consumers of media and political debates? Whereas the readers of this journal are connoisseurs of the

science-policy assessment process, many other people are not. Although Michaels does explore some interesting policy changes to rein in the product defense industry, neither he nor Oreskes really explores how other remedies, such as changes in early education, informal education, or both, might help to inoculate the thinking public from the type of shenanigans that they describe in their books. I would have been especially interested to hear them reflect on the potential of the growing citizen science movement.

My critique notwithstanding, David Michaels and Naomi Oreskes have crafted a pair of deeply researched and highly readable books. Both deserve focused reading and extended consideration by thoughtful people. Both are spot-on relevant to the tenor of our times. I fear the most important battle of the day is not limited merely to the role of sound science in the formation and implementation of public policy, but rather in stemming the erosion of *reason* within the context of political deliberation.

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