

The Professional Ethics of Witnessing Professionals

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Professionals have an ethical obligation to bear witness to climate change. They should report, warn, criticize, and lobby to bring attention to the existential threat that climate change poses. But they also have an obligation to respect the knowledge that is the basis of their authority to witness. Witnessing carries risks to this professional authority. Witnessing professionals should avoid letting bias distort their advocacy, simplifying their statements excessively, overplaying the consensus in the field, neglecting their own conflicts of interest, and claiming authority beyond their areas of expertise. To witness ethically, the professional should advocate responsibly.

“**W**hat you have to say needs to be heard. . . . Are you willing to be a witness?”¹ Rafe Pomerance, director of Friends of the Earth, put the question to James Hansen, a prominent physicist turned climate scientist whose research on global warming pointed to the dangers of rising sea levels and other environmental changes with potential for catastrophic harm to the planet. Hansen had earlier concluded that carbon dioxide in the atmosphere would lead to warming sooner than previously predicted. As a scientist working at the Goddard Institute for Space Studies, he had tried to stay focused on his research and wrote mainly for his scientific colleagues. But then, recognizing that politicians, the public, and even many other scientists did not appreciate the seriousness of global warming, he accepted the challenge of the question that Pomerance put to him.² He became a witnessing professional. His testimony to Congress in 1988 dramatically put global warming on the public agenda. His subsequent advocacy furthered the cause, helping to make “the greenhouse effect” a familiar term in the public discourse.

Hansen’s witnessing was widely praised but not all of his efforts were welcomed. The government agency he worked for censored his remarks, and he ultimately left government service. Later, he became an advocate for nuclear power as an alternative to environmentally harmful fossil fuels.³ In the process, he provoked the ire of many of his former allies in the climate change movement, some of whom believed he was proposing a cure that was worse than the disease.⁴ He

appeared to be going beyond his own area of expertise and pronouncing on subjects on which he had no special authority to speak.

Hansen's career exhibits to a high degree the ideal of witnessing, a professional obligation that he admirably exemplified. But it also reveals one of the risks of witnessing, the temptation to speak beyond one's professional authority. It exposes a particular aspect of the general tension between the obligation to witness and the obligation to respect the knowledge that is the basis of professional authority.

I argue that professional ethics should include an obligation to witness: to speak and act publicly to call attention to existential threats to the society and the planet.⁵ But I also want to emphasize that this obligation poses challenges, not simply personal ones such as risks to a career, but also professional ones, such as risks of misrepresenting the knowledge that gives the professional the authority to speak. As professional ethics is broadened to include witnessing, this internal conflict becomes more acute.

Professional ethics only recently and still fitfully accommodates this broader notion of an obligation to witness. When we started the university-wide ethics center at Harvard more than thirty years ago, one of our aims was to strengthen teaching and research on ethics in the professions. Professional ethics was not prominent in the professions, at least not the kind of ethics that required serious theoretical and intellectual reflection, and even less ethics that included the obligation to bear witness.

That began to change, not mainly because of our efforts, I admit, but largely because of a wave of scandals that plagued many of the professions and business. Our own center was located in a building named for Alfred A. Taubman, who went to prison for price fixing in the auction business. Ethics courses began to be required in many law, medical, and business schools. Professional associations took notice. Applied ethics journals sprang up. Degree programs appeared. The ethics movement gained momentum not only among lawyers and doctors but also in the training of police officers, veterinarians, accountants, even economists. I was surprised myself just how far this movement has spread. Like many who teach ethics, I receive many textbooks in the mail. So when I received a book called *Undertaking Ethics*, I thought at first the title referred to "undertaking" as in "to begin" or "take on."⁶ But it turned out really to be about undertakers and the ethical dilemmas they face. Professional ethics now goes from cradle to grave.

This growing interest in professional ethics tended to emphasize only one aspect of the ideal of service that characterizes the professions. The primary subject of the service was still the patient, the client, the shareholder, the research community, and the cadaver. There was less attention to the other aspect of the service ideal: the responsibility to the public or society more generally. Professional ethics has begun to attend to the obligations that professionals have to bring their expertise to bear on issues of public welfare. It is increasingly rec-

ognized that they owe more to society generally, not only to the particular individuals they serve. Even undertakers ought to show some consideration for the environment.

Professionals can engage in the climate debate just like any citizen. They can step out of their professional role and speak as a concerned member of the public. But the professional's obligation to witness is different from and stronger than the obligation that they may have as a citizen. Professionals have special expert knowledge, hold positions of potential influence, and enjoy the privileges granted by society to their profession. These three characteristics of professionals together create an obligation to contribute more to preventing social harms than is usually expected of an ordinary citizen.

The obligation does not extend to all social harms. Because professionals have other obligations – notably to their clients, patients, colleagues, and students – their time for satisfying the demands of the service to the public is limited. It is a scarce resource and should be deployed for compelling reasons. Climate change understood as an existential threat surely qualifies as such a reason.

The strength of the obligation to bear witness varies in proportion to the knowledge and the influence the professional possesses. The more the professional knows or should know, and the more potential influence the professional has, the greater the obligation. Also, the obligation is stronger to the extent that the threat is being ignored or neglected by leaders (such as politicians and corporate executives) who are in a position to bear witness but fail to do so. The obligation applies in the first instance to some climate scientists, who are the examples commonly used in discussing witnessing. But it sometimes applies even more to other professionals such as lawyers and judges. Judges, for example, do not have to become climate activists, but they should at least be willing to acknowledge the threat and accept the obligation to learn more about it. They should not act with indifference as Justice Antonin Scalia did when he was corrected for confusing the troposphere with the stratosphere. “Troposphere. Whatever. I told you before I’m not a scientist. . . . That’s why I don’t want to have to deal with global warming, to tell you the truth.”⁷

Medical professionals are in a position to call attention to the effects of climate change on public health. Journalists, too, have a role. They have a responsibility to avoid false equivalence in their reporting on climate deniers and climate activists. Then there are the meteorologists on TV, who, though they are in a position to bear witness before wide audiences, have been among the professionals most reluctant to acknowledge the threat of climate change. Less than half of all U.S. broadcast meteorologists believe that human activity is the primary cause of climate change over the past fifty years, and only 12 percent or fewer are very comfortable with presenting information about global climate impacts, mitigation strategies, or future global climate projections.⁸

There are many ways to bear witness. I mention four – all forms of advocacy – in order of increasing activism. First, reporting: the professional simply but persistently affirms the findings of climate science for the benefit of those who may not have paid attention. Second, warning: the professional emphasizes the dire consequences that climate change is likely to bring if action is not taken. This is what Naomi Oreskes calls the role of “sentinel.”⁹ Third, criticizing: the professional directly confronts the climate deniers and corporate interests that stand in the way of countering global warming. Fourth, lobbying: the professional argues for particular policies such as a carbon tax or reduction in coal production; or more general and less controversial goals such as greater funding for research and more accurate accounting of the costs of climate change.

There are also many possible audiences for witnessing. The general public is the audience most often assumed by proponents of witnessing. But witnessing can take place in small groups, professional associations, educational institutions, and a wide variety of other settings. (I use “public forum” to refer to all of these sites.) Witnessing can take the form of statements, testimony, reports, petitions, media appearances, social media posts, podcasts, and other modes of communication. Witnessing can be solitary, but more often it is collective, as professionals join with others to report, warn, criticize, and lobby.

Attempting to fulfill the obligation to witness is not easy. The reason is not simply the practical limitations of time, resources, or the prospect of political pressure. The reason I emphasize here is that service to the public may conflict with the obligation to respect the body of knowledge that gives a professional the authority to speak in the first place. Broadening the obligation to require professionals to bear witness (which includes speaking persuasively to a wider public) creates a tension with the obligation to present their expert knowledge responsibly (which is the essence of professing). Professionals who dare to enter the public debate on climate change may face a conflict between witnessing and professing. The needs of public communication are not always compatible with the obligations of professional authority.

This potential conflict poses five distinct challenges. The witnessing professional must be able to communicate without exhibiting undue bias, excessive simplification, improper dependence, overplayed consensus, or misplaced expertise. In each case, these vices result from carrying the legitimate demands of witnessing too far, failing to find an equilibrium between witnessing and professing. The aim should be to witness responsibly: to serve society and respect professional authority at the same time.

In *opposite advocacy*. To be an effective witness in the public forum, a professional may have to act more like an advocate than like an “honest broker.”¹⁰ As an advocate (even when reporting), the professional may have to em-

phasize one side more than another in the debate – for example, the dangers of climate change more than the uncertainties about its extent. The challenge is to engage with this degree of advocacy, but to avoid bias that would distort professional knowledge. Witnessing professionals must maintain the distinction between emphasizing some facts rather than others (acceptable advocacy), and making sure that the facts that are emphasized are not reported inaccurately (inapposite advocacy). Professionals need not tell the whole truth (as they would seek to do in scholarly writings), but they must affirm nothing but the truth. This distinction between the selection of facts and the presentation of facts is not always easy to maintain. Facts do not stand alone, but require interpretation, and may involve reference to other facts that the advocate might prefer to slight. Facts that bear on the strength of the claims one is making should not be omitted. The challenge of maintaining this distinction is illustrated by the controversy over a blog post by Roger Pielke, a prominent contributor to the climate debate who recommends that scientists assume the role of honest broker rather than act as an advocate.¹¹ As part of the inaugural edition of Nate Silver’s *FiveThirtyEight* site, Pielke argued that weather disasters are not mainly caused by climate change. He presumably thought he was acting as an honest broker, providing balance to what he saw as the exaggerated claims of other scientists. Even if his factual claims were true – and critics challenged them¹² – his post was seen as supporting climate deniers. (Some critics question whether he has been an honest broker in other instances as well.)¹³ In any case, adopting the role of honest broker is not sufficient if the aim is to alert the public to the dangers of climate change. Witnessing professionals would do better to emphasize instead the long-term harms rather than getting involved in controversies about the causes of particular weather disasters.

If professionals are to be advocates, what should they be advocating for? The role is protean. Sometimes it implies advocacy simply for more research on climate change, as Robert Socolow proposes.¹⁴ This goal is worthwhile provided it is not used as an excuse to avoid undertaking more active measures. Sometimes the role includes a more controversial form of advocacy, recommending policies such as carbon caps or methods of geoengineering interventions or even nuclear power. The risk of bias becomes greater here, as the professional may find it harder to avoid becoming embroiled in partisan battles. (Also, the temptation is greater to make claims that go beyond one’s professional competence, as I discuss below.)

If this kind of advocacy is thought to compromise professionals’ standing as impartial authorities, they may choose a more general kind that stands a better chance of avoiding narrowly partisan politics. Environmental ethics scholar Dale Jamieson, for example, advocates for seven priorities, most of which could be accepted by a wide range of climate activists whatever their partisan affiliation.¹⁵ They include such general aims as integrating adaptation strategies with development plans, adopting and diffusing technologies that are already “on the shelf,”

and instituting full-cost energy accounting. Witnessing professionals addressing climate change cannot (and should not) completely avoid political controversy, but even when they advocate, they do not have to identify with a particular political party or special interest group.

One of the most appropriate approaches for the witnessing professional would be to adopt the role of Oreskes's sentinel. The professional would accept the responsibility of alerting the public, in no uncertain terms, to the impending disasters that climate change is bringing. This role does not abandon the commitment to facts, but presents them in a way to call attention to the threat. The sentinel does more than advocate for more research but less than lobby for particular policies (though some activists may of course seek to be lobbyists as well as sentinels). Even as the witnessing professionals scrupulously respect the facts they use and seek to remain neutral on policies they might mention, they do not have to allow the uncertainties that are inevitable in climate science to weaken the forcefulness with which their warnings are presented.

E*xcessive simplification.* The expertise the professional brings to the public forum is not easily conveyed to a general audience. Some simplification is necessary, but it can go too far. It is a "massive oversimplification" to reduce "the complexity of climate change . . . into the sound bite of 'climate change means more extreme weather.'"¹⁶ This not only misrepresents the "true state of science" but also risks discrediting valid claims about the effects of climate change. Not all simplifications are to be avoided, even when they are inexact. F. Sherwood Rowland in 1974 used the phrase "hole in the ozone layer" to describe the thinning of ozone in high latitudes.¹⁷ (The thinning is the result of the chemical action of chlorofluorocarbons, and it increases ultraviolet light at ground level, giving rise to an increased risk of skin cancer, among other harmful effects.) The term quickly became a catch phrase. But technically, there is no hole and no layer. Scientific journals at first resisted the phrase but even they eventually came to accept it. The phrase describes a real problem in vividly accessible terms, and while not literally true, it is not practically misleading. It does not carry any implications for policy that differ from those of an unsimplified picture of the depletion of ozone. Refusing to simplify when it is appropriate as in this case is to risk being overly punctilious, the opposite vice of excessive simplification.

How can witnessing professionals make their case without distorting the complexity of their knowledge? Some professionals are more adept than others in translating the science into messages that are accessible to a wider public. Division of labor may be necessary. Professionals who are more comfortable in the public sphere can work with their more cloistered colleagues to shape a message that can be more accessible. It is important also to remember that there is not a single audience. There are other scientists not specializing in climate science and

even informed policy analysts who can follow technical discussions and help translate the findings into language that journalists and commentators can follow. The journalists and commentators can then prepare messages that are more readily comprehensible. The process of communication is distorted if we think of the witness as a lone climate scientist who has to bear witness all on his or her own.

The risk remains that in this translation process, the science will be simplified excessively. It may be sensationalized in one direction or minimized in the other. The best protection against this risk is to be found in the reactions of scientists themselves. They are witness not only to climate change but also witnesses to how the information is conveyed to the general public. Even the scientist who is not adept at public communication may be in the position to call out distortions and simplifications as they reach the end of the communication chain. This kind of feedback loop already exists to some extent, but it should be explicitly recognized and further reinforced.

Overplayed consensus. To support their claims in the public forum, witnessing professionals are inclined to appeal to the authority of professional opinion. This is perfectly legitimate since they speak not for themselves but for a body of knowledge that partly defines their profession. However, under pressure, some may be tempted to exaggerate the degree of consensus that exists in the profession. They may be inclined to downplay, for example, genuine differences that exist in the estimates of the rate at which global warming is occurring. The more controversial the professional opinion, the more professionals feel the need to enlist the support of fellow professionals, and the greater the temptation to overplay the degree of consensus. The risk is real, though there is no evidence that exaggeration is widespread among climate scientists themselves.

There may be a problem even when the consensus is strong. On climate change, nearly all experts agree that global warming is real, and most agree that humans are a principal cause. But when an activist asserts that 97 percent of climate scientists agree about the cause of global warming, some scientists may recoil.¹⁸ Socolow argues that overplaying consensus can mischaracterize the way science proceeds; it neglects the role of scientific dissent in challenging conventional views by bringing forward new evidence and new theories. As he writes:

If the goal is to persuade a scientist that some specific research community is conducting its work according to the norms of science, assertions that 97 percent of scientists in that community believe X (no matter what X is) are counterproductive. . . . When a scientist in another field hears “97 percent,” she worries whether this is a field seeking consensus rather than searching for disruptive insights.¹⁹

Overplaying consensus may risk alienating some scientists, but the aim is not only or mainly to raise the status of climate science within science. Scientists are

only one audience. Claims of consensus (when well founded) are less likely to be counterproductive with journalists and the general public.

The witnessing professional has to find the balance between appealing to consensus and respecting the skeptical ethos of the scientific enterprise. In seeking that balance, the professional should clearly identify degrees of consensus, and differentiate issues on which there is agreement approaching consensus from those on which there is not. The professional should acknowledge that any consensus that might exist on broader questions of climate change breaks down as soon as the discussion turns to policy: what exactly should be done, and who should do it? But even when most climate scientists agree, professionals should not overplay the consensus card. They should make clear that “science . . . isn’t about voting” and that “every good scientist leaves room for doubt.”²⁰ An early influential paper documenting the scientific consensus on climate change proceeds in this spirit and strikes the balance that witnessing professionals should strive for.²¹

On some of the claims that the professional wishes to make, consensus is not to be found. There is no consensus on what counts as a “climate emergency,”²² but that should not stop the professional from arguing for the claim that we are facing a crisis of that magnitude. If consensus is treated as the only or main basis of professional authority, the scope for witnessing is drastically reduced. Professionals should be prepared to bear witness in a realm of plausibility, in which the standard is sufficient agreement rather than complete consensus.

Improper dependence. Professionals can often be more effective if they work with officials in government and corporations. They need funds to support their research, and sometimes funds to publicize their findings. But if they get too close, they risk sacrificing their independence. They end up serving special interests rather than the public interest. The risk is well known in the case of funding from industry, though it is climate deniers who are more likely to receive such support.²³ But the motives of professionals have been questioned even when their support comes from the government. A Heritage Foundation critic remarked: “A lot of people are getting really, really rich off of the climate change industry. . . . The tidal wave of funding does reveal a powerful financial motive for scientists to conclude that the apocalypse is upon us.”²⁴

The witnessing professional may not be able to respond directly to this kind of cynicism about their motives. The best answer is to defend one’s conclusions on the merits in the public forum. But the ever-present doubts about motives underscore the need for rigorous conflict of interest policies. These are familiar enough in research funding, but that they are needed in witnessing is not so widely recognized. Like the research scientist, the witnessing professional should take steps to avoid conflicts of interest, or at least disclose conflicts if avoidance is not feasible. The aim is not so much to prevent professionals from shading their conclu-

sions to please their industry or government sponsors (which may happen) but to reduce the chances that they will appear to be influenced by their sponsors even when they are not. The purpose of conflict of interest policies is to maintain public confidence. The policies are intended to give the public, most of whom cannot personally know the professionals, some assurance that they are not being unduly influenced. Disclosure of funding sources, affiliations with interest groups, and professional background would be a worthwhile first step toward transparency.

Misplaced expertise. Professionals are typically specialized and their expertise is limited to specific subjects. But climate change is a large subject, calling on the expertise of many different scientists, lawyers, and health professionals. When speaking out, professionals may be tempted to make pronouncements about matters beyond their area of expertise. Recall the criticism that James Hansen encountered when he ventured from his expertise on climate science to his advocacy of nuclear power.

When professionals are thrust into the public forum, they may feel that they are being evasive, even irresponsible, if they refuse to answer questions that are relevant and reasonable but go beyond their limited area of expertise. Naomi Oreskes describes what must be a common experience of climate scientists in dealing with the press.²⁵ As a geologist, she is knowledgeable about such matters as carbon sequestration, but reporters treat her as an expert on everything to do with climate change. She believes that “we need . . . to be witnessing professionals in our domain of expertise, but we also need to act with respect for colleagues who are the appropriate witnessing professionals in other domains.”²⁶ She keeps a list of experts in other fields, to which she refers reporters who ask questions that go beyond her professional competence. She doubts that most reporters, under deadline pressure, follow up. Her experience shows that even when scientists are scrupulous about their obligation to limit their witnessing to their area of expertise, journalists do not accept their claims of professional modesty. It is therefore not only scientists but also journalists and other professionals who must avoid the tendency to stretch expertise beyond its reasonable limits. That does not mean that professionals should never speak on matters outside their own field, but that if they do, they should make their qualifications clear. Misplaced expertise is a peril of witnessing that deserves constant attention from all professionals.

Some professionals are already responding to the call to bear witness to the harms that climate change is visiting upon the planet. They are reporting, warning, criticizing, and lobbying. We should encourage more to take up the cause, and not only the climate scientists but also physicians, lawyers, judges, public health officials, journalists, broadcast meteorologists, and undertakers. Part of the professional ideal of service demands witnessing. But I have also em-

phasized that, as professionals bear witness in the public forum, they should not neglect the other aspect of the professional ideal: the respect for professional authority. They must temper their witnessing with appropriate deference to the specialized knowledge that is the basis of their professional authority. The challenges of witnessing are great, but so are the harms that climate change threatens.

AUTHOR'S NOTE

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ENDNOTES

- ¹ Nathaniel Rich, *Losing Earth: A Recent History* (New York: MCD, Farrar, Straus and Giroux, 2019), 70.
- ² James Hansen, "Why I Must Speak Out about Climate Change," transcript, TED Talk, February 2012, https://www.ted.com/talks/james_hansen_why_i_must_speak_out_about_climate_change?language=en.
- ³ James Hansen, Kerry Emanuel, Ken Caldeira, and Tom Wigley, "Nuclear Power Paves the Only Viable Path Forward on Climate Change," *The Guardian*, December 3, 2015, <https://www.theguardian.com/environment/2015/dec/03/nuclear-power-paves-the-only-viable-path-forward-on-climate-change>.
- ⁴ Jim Green, "Don't Nuke the Climate! James Hansen's Nuclear Fantasies Exposed," *The Ecologist*, November 20, 2015, <https://theecologist.org/2015/nov/20/dont-nuke-climate-james-hansens-nuclear-fantasies-exposed>; and Robert H. Socolow and Alexander Glaser, "Balancing Risks: Nuclear Energy & Climate Change," *Dædalus* 138 (4) (Fall 2009): 31–44.

- ⁵ “Professionals don’t have to serve the cause of malignant normality. They are also capable of using their knowledge and technical skills to expose and bear witness to such normality, to become witnessing professionals.” Robert J. Lifton, *The Climate Swerve: Reflections on Mind, Hope and Survival* (New York: New Press, 2017), 98, 93–100.
- ⁶ Funeral Ethics Association, *Undertaking Ethics* (Springfield, Ill.: Funeral Ethics Association, 1998).
- ⁷ *Massachusetts v. Environmental Protection Agency*, 549 U.S. 497 (2007), oral argument, http://www.oyez.org/cases/2000-2009/2006/2006_05_1120/argument.
- ⁸ Edward Maibach, David Perkins, Zephi Francis, et al., *A 2016 National Survey of Broadcast Meteorologists: Initial Findings* (Fairfax, Va.: George Mason University Center for Climate Change Communication, 2016), https://centralassets.s3.amazonaws.com/pdfs/2016_AllMetsSurvey_ClimateMatters.pdf.
- ⁹ Naomi Oreskes, “What Is the Social Responsibility of Climate Scientists?” *Dædalus* 149 (4) (Fall 2020).
- ¹⁰ Roger A. Pielke Jr., *The Honest Broker: Making Sense of Science in Policy and Politics* (Cambridge: Cambridge University Press, 2007). Jessica Green rightly criticizes Pielke for limiting the role of a professional to that of honest broker, but she goes further and urges academics “to lay bare the entrenched economic interests that prevent us from a transition to fossil-free energy.” Promoting a radical program of reform may be justified but it is not the only alternative to acting as an honest broker, and not the only way to bear witness, as indicated above. Jessica F. Green, “Why We Need a More Activist Academy,” *Chronicle of Higher Education*, July 15, 2018.
- ¹¹ Keith Kloor, “Roger Pielke Jr. on FiveThirtyEight and His Climate Critics,” *Discover Magazine*, July 28, 2014, <http://blogs.discovermagazine.com/collideescape/2014/07/28/roger-pielke-jr-fivethirtyeight-climate-critics/#.XGwvaS3MzOQ>; and Dana Nuccitelli, “FiveThirtyEight Undermines Its Brand by Misrepresenting Climate Research,” *The Guardian*, March 25, 2014, <https://www.theguardian.com/environment/climate-consensus-97-per-cent/2014/mar/25/fivethirtyeight-misrepresents-climate-change-research>.
- ¹² Nuccitelli, “FiveThirtyEight Undermines Its Brand by Misrepresenting Climate Research.”
- ¹³ Dale Jamieson, *Reason in a Dark Time: Why the Struggle Against Climate Change Failed – And What It Means for Our Future* (New York: Oxford University Press, 2014), 68–69.
- ¹⁴ Robert H. Socolow, “Witnessing for the Middle to Depolarize the Climate Change Conversation,” *Dædalus* 149 (4) (Fall 2020).
- ¹⁵ Jamieson, *Reason in a Dark Time*, 228–235.
- ¹⁶ Vladimir Janković and David M. Schultz, “Atmosfear: Communicating the Effects of Climate Change on Extreme Weather,” *Weather, Climate, and Society* 9 (1) (2017): 35, 27–37.
- ¹⁷ Rich, *Losing Earth*, 102–103.
- ¹⁸ John Cook, Dana Nuccitelli, Sarah A. Green, et al., “Quantifying the Consensus on Anthropogenic Global Warming in the Scientific Literature,” *Environmental Research Letters* 8 (2) (2013): 024024. For a critical comment, see Earl J. Ritchie, “Fact Checking the Claim of 97% Consensus on Anthropogenic Climate Change,” *Forbes*, December

14, 2016, <https://www.forbes.com/sites/uhenergy/2016/12/14/fact-checking-the-97-consensus-on-anthropogenic-climate-change/#65db94cc1157>.

¹⁹ Socolow, “Witnessing for the Middle to Depolarize the Climate Change Conversation.”

²⁰ Ibid.

²¹ Naomi Oreskes, “The Scientific Consensus on Climate Change,” *Science* 306 (5702) (2004): 1686.

²² Jamieson, *Reason in a Dark Time*, 221–222.

²³ See, for example, Justin Gillis and John Schwartz, “Deeper Ties to Corporate Cash for Doubtful Climate Researcher,” *The New York Times*, February 21, 2015. On the importance of disclosure, see Naomi Oreskes, Daniel Carlat, Michael E. Mann, et al., “Viewpoint: Why Disclosure Matters,” *Environmental Science and Technology* 49 (2015): 7527–7528.

²⁴ Stephen Moore, “Follow the (Climate Change) Money,” The Heritage Foundation, December 18, 2018, <https://www.heritage.org/environment/commentary/follow-the-climate-change-money>.

²⁵ Oreskes, “What Is the Social Responsibility of Climate Scientists?”

²⁶ Ibid.