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Arguments versus Values

[Naomi Oreskes, *Why Trust Science?*, Princeton, Woodstock: Princeton University Press, 2019, pp. 360.]

In the face of the rejection-of-authority problems that science is suffering from, researchers usually seem to embrace one of the general attitudes that belong to the so-called cycle of acceptance. Thus, there are those who simply refuse to recognise that their papers are not read and ideas undermined by those who are patently non-experts. Others are angry about the situation and blame whomever for being blind to the value of their knowledge and discoveries. Many fumble with the social influence and achievement demands and either accept them or pay for their vacillation with depression, burnout or other problems. And there are, of course, those who do not care.[1] Sad as this overview might be, neither are the attitudes towards a traumatic situation that the cycle of acceptance provides the only possible ones nor is the scientific world limited to those incapable of attempting to lead us out of the check in which we have found ourselves. Whether such attempts are convincing and effective or not is, however, a different matter.

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[1] Elisabeth Kübler-Ross, David Kessler, *On Grief and Grieving: Finding the Meaning of Grief through the Five Stages of Loss* (New York: Scribner, 2005), passim.

As the cover of Naomi Oreskes' *Why Trust Science?* indicates, the book is an attempt of the type; and as such, it is worth attention. The surge of non-expert opinions on life-important matters which blatantly go against achievements of science has already reached the level at which it is threatening not only their articulators' lives but also our own.[2] Hence, works addressing the eponymous question are much needed. Flipping the intriguing cover, we find that the body of the book includes, to simplify, seven chapters divided into three sections. Although, structurally, this might seem to be nothing unusual, the relationship with which the author concatenates these is appealing. Chapters one and two follow the introduction, are closed with codas, and contain the background for as well as the arguments the author develops. Having presented her ideas, Oreskes has them commented on by Susan Lindee, Marc Lange, Ottmar Edenhofer and Martin Kowarsch, and Jon. A. Krosnick in the next four chapters. The last section includes the author's reply to her colleagues' observations and the afterword. Thus, the book has the structure of a polylogue; which, undoubtedly, is an advantage too. Let us have a closer look at its contents.[3]

In the introduction to *Why Trust Science?*—written by Stephen Macedo—we read that, in the context of science being currently heavily questioned and misrepresented in the media and politics, as well as researchers and non-experts disagreeing on even such obvious issues as global warming, Oreskes' explanations as to why we should trust science are timely.[4] The introduction neatly summarises them and informs the reader about the structure of the book; which is very serviceable because it does not follow the typical single-author monograph structure (even though the cover suggests this).

Chapter one is an overview of selected ideas and arguments in favour of science as a worthy and reliable pursuit. The author begins by citing the eighteenth-century Comtean assumption that the reliability of science is a consequence of the reliability of the man behind it, and segues into drawing from more and more contemporary thinkers—e.g., Fleck, Kuhn—

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[2] Daniel J. Levitin, "It's Time to Stop Letting So-Called 'Experts' Comment on Subjects They Know Nothing about," *Quartz*, accessed 17 September, 2020, https://qz.com/949347/daniel-levitins-weaponized-lies-the-dangerous-rise-of-pseudo-experts/.

[3] Naomi Oreskes, *Why Trust Science?* (Princeton, Woodstock: Princeton University Press, 2019).

[4] Stephen Macedo, Introduction to: Naomi Oreskes, *Why Trust Science?* (Princeton, Woodstock: Princeton University Press, 2019), pp. 1–14.

to support herself in substantiating the mentioned objective.[5] Finally, Oreskes reaches the crux of her argumentation and adduces the most up-to-date view held by the scientific environment, i.e. that "scientific knowledge [is] fundamentally *consensual*."[6] This particular basis serves her as a springboard to claim that science should be trusted because of "1) its sustained engagement with the world and 2) its social character."[7]

As far as this chapter is concerned, it seems to mix Oreskes' great practical insight with off-base idealism. On the one hand, her argument that "[s]cientists are our designated experts for studying the world"[8]—and hence, we should trust them—is what I consider an effective means with which to convince a layman about the value of science. One brutal truth of our reality is that we tend to want the best quality as regards the items we buy or the people we rely on. Making people aware that scientists are the ones who can provide the knowledge of the best possible quality is simply a clever (marketing?) gesture which is likely to yield effect.

On the other hand, the author also offers ideas which push one into thinking that she idealises science too strongly. For instance, she claims that, because the scientific consensus is based on self-correcting mechanisms— such as peer review, tenure, grants, etc.—it promises the most objective knowledge on a particular matter, and hence, it should be convincing for non-experts. It is only my surmise that she wishes to present this argument as tightly concatenated with her remaining ideas—which concomitantly would offer a picture of science that idealistically generates the best possible knowledge thanks to its super-strict mechanisms—but the problem is that no ideal self-correcting mechanisms and, resultantly, no ideal consensus exist. Oreskes' respondents aptly point this out, while I would like to add that peer review includes also reviewers who are not experts in exactly the filed which a particular text covers. Tenure functions in the U.S. but it does not exist, for instance, in Poland. Grants are given based on a "promise" made by a scientist, not based on the actual research that has already been carried out. In other words, although the mechanisms that Oreskes

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[5] For the sake of brevity, I do not adduce all the arguments deployed by the author. The ones I consider worthy of attention or spurious are addressed directly in my comments on the sections written by Oreskes herself or indirectly in my remarks on the replies she received.

[6] Naomi Oreskes, "Why Trust Science? Perspectives from the History and Philosophy of Science," in: *Why Trust Science?* (Princeton, Woodstock: Princeton University Press, 2019), p. 19.

[7] Oreskes, "Why Trust Science?," p. 55.

[8] Ibid., p. 56.

mentions undoubtedly have the potential to aid science in nurturing its reliability, their existence *per se* cannot be treated as an argument supporting it. Furthermore, I am unconvinced that common people know about such mechanisms, let alone trust grant certificates displayed on a wall of an expert's office (rather than the neighbourly word of mouth).

Interestingly, the argument that Oreskes offers in the coda of the first chapter of the book might work much better than her emphasis of the self-correcting character of science. Closing this chapter, the author points to the conflict of interest that, for instance, tobacco companies have with scientists and scholars as regards the research on the effects of smoking. She aptly points out that science done for the sake of obtaining knowledge is much more trustworthy than that done for the sake of earning money. As straightforward as this argument might seem, let us remember that these are not scientists and scholars who doubt science *en masse,* but these are non-experts; and the arguments need to be adjusted to the world perception of the latter.

In chapter two—"Science Awry"—Oreskes lists five examples of scientific activities which flopped. These are the acknowledgement of Edward H. Clarke's idea that the pursuit of higher education negatively affects women's fertility; rejection of Alfred Wegener's continental drift theory; support of eugenics; ignorance of the links between hormonal birth control and depression; promotion of dental flossing without necessary evidence and tests. As the author claims, in this way, she touches upon the most crucial problem concerning our trust in science: if we know that a today claim might be debunked tomorrow, how can we trust the science that suffers from "the instability of scientific truth"?[9] One might feel a bit surprised with the opening of this chapter as the examples selected by Oreskes suggest that we cannot always trust science. Paradoxically, the author makes them the basis on which to rework Pascal's wager for the purposes of her text. According to her, just as for Pascal God is an entity that one can believe in or not, and the first option is more beneficial, so science is what we can trust or not and, again, the first option is more beneficial. Oreskes' adaptation of Pascal's idea obviously has the advantages of the original claim, but it is also open to the criticism that this claim has been

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[9] Naomi Oreskes, "Science Awry," in: *Why Trust Science?* (Princeton, Woodstock: Princeton University Press, 2019), p. 74.

subjected to. Knowing the history of Pascal's wager, we can suspect that her idea does not seem to have a bright future ahead of it. The first section of the book is closed with the coda in which the author argues in favour of not really a novel claim that the science one pursues is connected with the values one embraces.

The second section of the book includes four commentaries on Oreskes' proposals. The first one concerns the trust in science that can be built on the basis of our trust in everyday technologies. Its author—Susan Lindee—rightly doubts that Oreskes' "consensus" argument might convince science sceptics—one can *always* find scientists who disagree with dominant views—and develops the argument that, just as people appreciate the technology behind, for instance, frozen peas, so it might be advisable to make them aware of—and hence, appreciate—the scientific knowledge behind this technology. As it seems, Lindee's argument with which to convince people to trust science is connected with the type of conveying knowledge in the accidental, and hence, not highly effective way. If this is so, then two contrastive questions might be asked: Which busy adult would want to find time to listen to an explanation of the technology behind frozen peas or warm ice cream? And more importantly: in this chaotic world of ours, do we not gain accidentally lots of "unnecessary" knowledge which, at some point, changes our lives?

Marc Lange's commentary addresses Oreskes' idea of justifying science *in toto* as being informed by circular logic. The most persuasive argument he gives is that we cannot expect sceptics to trust experts chosen by other experts who have also been labelled as such by yet other experts—all of whom sceptics do not trust. Distancing himself from this logic, Lange proposes that science should not be justified in total but that particular scientific achievements should have their positive accounts spread across the media. Much as Lange is right about scientists needing to promote their achievements—this is, after all, one of the staples of good marketing—I doubt that "leaving behind" the "flopped" science is a good idea—sceptics are not likely to give this a miss. Especially since fishing mistakes out of the sea of scientific accuracies seems to be one of their preferred strategies to validate their points of view.

In chapter five, Ottmar Edenhofer and Martin Kowarsch use Oreskes' claim about the scientific consensus as a springboard for their discussion

of how this consensus does not—while it should—translate into policy-making. Perhaps the most illuminating example showing how Oreskes' wager is unlikely to be effective concerns the situation in which Trump's administration representatives admit to the dire consequences of climate change, but they see the consequences of attending to the problem as much direr. According to the authors, the solution is "to go further than normative transparency in scientific assessments and consistently embed divergent values and principles like equality, liberty, purity, nationalism, etc. in different future scenarios and policy pathways."[10] Noble as their idea is, they fail to propose any details regarding its implementation. If they note that scientists' findings are acknowledged but have little, if any, effect, one may also ask whether and how a policy that scientists would propose is to have any effect. That a scientist puts forward a policy does not mean that it will be implemented. For this to happen, a lot more—e.g., a lobbying group, contacts with politicians, or other forms of leverage—is needed.

The final response to Oreskes' claims, authored by Jon A. Krosnick, covers the internal problems from which science suffers (including publishing texts behind which there is either manipulated or no research). Listing many of these, Krosnick concludes that "rather than funding sources, the fundamental problem is with the incentives inherent in the world in which science operates today."[11] Unfortunately, he provides no solution of his own but merely urges scientists to put forward such solutions and test them. Substantively, this chapter is the lowest part of the book—most of its readers are likely to be at least vaguely familiar with such phenomena as an article's being retracted or data being selected to match a particular conclusion. Thus, Krosnick's list offers little additional value and does not deepen one's understanding of the problem.

The third section of the book includes Oreskes' response to the mentioned commentaries as well as the afterword. Although the author's response is structured in such a way so as to address the four commentaries one by one, it is selective as to what is omitted and what is taken into consideration. For instance, when replying to Susan Lindee's remarks, Oreskes does not defend

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[10] Ottmar Edenhofer and Martin Kowarsch, "Pascal's Wager Reframed: Toward Trustworthy Climate Policy Assessments for Risk Societies," in: *Why Trust Science?* (Princeton, Woodstock: Princeton University Press, 2019), p. 198.

[11] Jon A. Krosnick, "Comments on the Present and Future of Science, Inspired by Naomi Oreskes," in: *Why Trust Science?* (Princeton, Woodstock: Princeton University Press, 2019), p. 210.

her idealistic view of the scientific consensus but focuses on criticising her colleague's argument that explaining science behind everyday technology might change one's attitude. Much as Oreskes is right that explanations are often not enough to change one's mind, she appears to be too harsh in her arguments and to go against her own ideas. It is simply an exaggeration to assume that an average person may not understand the science behind the smartphone and that technology cannot be used as a means to attest to the truth of the theory behind this very technology; all this is case-dependent and a matter of word choice.[12] Ultimately, this is how, to a certain extent, educating students works nowadays.

As it turns out, Oreskes does not defend her idealistic view of the scientific consensus for a particular reason. When replying to Lange's views, she tries to recalibrate it and proposes that, since we cannot know the truth, the consensus should be treated as the next best option, and hence, embraced. More than that, according to her, this is the case because "the signs of expertise—academic credentials, publications on the pertinent topic in peer-reviewed journals, awards, and prizes—are evident to non-experts."[13] As it seems, the author is aware of her fallacy but does not want to abandon it anyway.

Owing to the fact that Oreskes chimes with what Edenhofer and Kowarsch propose, and hence no alternative perspectives come to the fore, I move on to comment on her reply to Jon Krosnick's claims; especially that it is rather perplexing. First, the author agrees with her colleague that malfunctions of science—e.g. publications of blatantly erroneous texts— happen; then, however, she segues into excusing them. According to her, we should accept such malfunctions because "scientific knowledge is never created by a single study,"[14] so these do not matter. Finally, she downplays the retraction problem arguing that a few samples do not show that erroneous texts are everywhere and, rather than pointing to the increasing difficulties within the scientific community, such retractions indicate that we are more conscious of our security. Of course, this is a highly subjective matter whether one agrees or not that blatantly erroneous publications

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[12] Sean Carroll, "Physicist Explains Dimensions in 5 Levels of Difficulty," *Wired*, last modified October 16, 2019, accessed 6 June, 2020, https://www.youtube.com/watch?v=3KC32Vymo0Q.

[13] Naomi Oreskes, "Chapter 7. Reply," in: *Why Trust Science?* (Princeton, Woodstock: Princeton University Press, 2019), p. 222.

[14] Ibid., p. 232.

are just "work accidents" that do not matter. However, two moderately subjective arguments against this view are worth adducing. If we agree that science influences our lives, then such "work accidents" also influence us in—perhaps the slightest but nonetheless some—way, and hence, they do matter. Furthermore, retractions tend to happen for no paltry reasons but because the text in question is usually heavily flawed.[15] And ignoring plagiarism, data fabrication, compromised peer review is no path to be followed or ignored.

"One way to [show the trustworthiness of science] is by exposing the ideological and economic motivations underlying science denial, to demonstrate that the objections are not scientific, but political. Another is by explaining how science works and affirming that, under many, if not all circumstances, we have good reason to trust settled scientific claims,"[16] writes Oreskes in her afterword, and thus, reveals the core advantages and disadvantages of her work. On the one hand, *Why Trust Science?* is an illuminating book. Thanks to numerous explanations of how science works, it offers sundry examples which one can add to his or her repertoire of "how to respond to a science sceptic" or on the basis of which to formulate one's own arguments. It pushes the reader toward rethinking many issues, such as whether science needs to be justified *in toto* or not. And it surely is an important voice as regards the corner in which science has found itself.

On the other hand, the book does not take into consideration what I believe to be the key issue as regards the problem of trusting science. If, as all the contributors of the work seem to agree, one's (dis)trust in science is a result of the values one holds, and psychology has shown that our values depend on "age-related life circumstances and psychosocial development,"[17] then these are the questions that should be addressed when trying to answer the question why we should trust science. Oreskes' book does that vicariously, and hence, leaves the reader with the want of more direct answers to the question it poses.

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[15] Elizabeth C. Moylan and Maria K. Kowalczuk, "Why Articles Are Retracted: A Retrospective Cross-Sectional Study of Retraction Notices at BioMed Central," *BMJ Open*, Vol. 6, No. 11 (2016), p. 4, accessed 21 November, 2020, https://bmjopen.bmj.com/content/bmjopen/6/11/e012047.full.pdf.

[16] Oreskes' *Merchants of Doubt* concerns the first way she mentions. *Why Trust Science?* focuses on the latter one.

[17] Valdiney V. Gouveia, Kátia C. Vione, Taciano L. Milfont, and Ronald Fischer, "Patterns of Value Change During the Life Span: Some Evidence from a Functional Approach to Values," *Personality and Social Psychology Bulletin*, Vol. 41, No. 9 (2015), p. 1276, accessed 21 November, 2020, https://journals.sagepub.com/doi/abs/10.1177/0146167215594189.

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This review focuses on *Why Trust Science?* by Naomi Oreskes. It examines the book as far as its structure and, most importantly, argumentation is concerned. Much as the first one is worthy of attention, the latter one entails doubts. While the book is undoubtedly worth reading due to the topic it addresses—trust in science—the reader is advised to approach its argumentation with wariness.