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## Notas críticas/Critical Notices

### Citizens, Science, and Democracy

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*Science and Representative Democracy*, by MAURO DORATO, LONDON, BLOOMSBURY ACADEMIC, 2023, 177 pp. €38, 20.

In *Science and Representative Democracy*, Mauro Dorato proposes a deep and important analogy between the conceptual underpinnings of representative democracy (a human social practice or institution) and well-functioning science (another human social practice/institution). In the vision Dorato puts forward in this book, the two are so close as to be practically one. Both are at bottom essentially social practices aimed at *solving problems*; and both involve, quite essentially, delegating authority to experts who are entrusted with making decisions on behalf of the whole society in order to solve those problems. In the present age, when some of the most urgent challenges that governments face (e.g. climate change, epidemic management, and maintaining quality of life while transitioning toward sustainable, non-growth-focused economies) clearly require scientific knowledge and expertise to inform policy choices, Dorato's book aims to show that science education (broadly construed, and including both history of science and philosophy of science as essential components) is the key to meeting these challenges successfully.

In the introductory chapter Dorato sketches the two key theses that underpin the rest of his arguments:

T1: The increasing *specialisation* of scientific knowledge makes *indirect, representative* democracy (as opposed to direct democracy, deciding all questions by direct referenda) both inevitable and preferable.

T2: A well-functioning democracy must be based on the highest possible level of scientific literacy [pp. 1-2].

Through the rest of the book Dorato develops these theses in detail, in a series of seven chapters that unfold his argument with an unusually coherent logical progression. Chapter 1 sets the stage for the rest of the book by recounting a debate between Walter Lippmann and John Dewey in the early 20th century. Both thinkers recognised the problem that with the explosive growth of scientific knowledge, ordinary citizens cannot be expected to make well-informed decisions based on *their own* understanding of the intertwined scientific and political issues. But whereas Lippmann reached the relatively pessimistic conclusion that a large amount of control must inevitably be ceded to experts (technocrats), the public's actual role being reduced to a "phantom" status, Dewey argued that with a sufficiently good system of science education for all citizens, the latter can be genuine, autonomous participants in political decision-making, despite needing to cede epistemic authority to specialist experts on matters of scientific fact. Dorato argues for a similarly optimistic thesis in the rest of the book, adapted to the modern context in which social networks and the internet play such an important role.

Chapter two offers the reader a primer, or refresher, concerning the social nature of science and scientific methodology. The emphasis here is on the aspects of science's social organisation and its standard methods that ensure a sufficient objectivity and reliability of scientific knowledge: replication experiments, peer review, openness to debate and criticism, and so forth. In the somewhat idealised (but by no means naïve) picture of science sketched by Dorato, the social nature of science is essential for understanding its overall reliability and the rationality of trusting the top experts in each field, who are the only ones able to *directly* judge the acceptability of the results generated at the cutting edge of the field. Chapter three gives a similarly idealised overview of the political institution of *democracy*, emphasising that governments exist, at bottom, to *solve problems* faced by the citizens, individually and collectively. Just as theories in a scientific field may be discarded when new evidence arises that cannot be accommodated, in a democracy when a governing party proves unable to satisfactorily address citizens' problems, it may be discarded also, i.e., voted out in the next elections.

In chapter 4 Dorato argues that only representative democracy, not "direct" democracy, can possibly function effectively given the deep involvement of scientific knowledge and expertise in the problems facing

societies today (and even in the days of Dewey and Lippmann). In fact, representative democracy is just a further *example* of the ordinary citizens' need to defer to experts who can make judgments and decisions on their behalf. This is not a complete surrender of autonomy to the technocrats, however, because it can remain the case that, through their votes, citizens *set the agenda and choose the goals* that their elected representatives should aim to achieve. When those goals' achievement in turn requires input from scientific experts, the political representatives themselves must rely upon the experts. But the experts are not entirely isolated from the political sphere, of course, and on a particular issue (e.g. Covid-19 vaccine policy, or renewable energy policies) the public indirectly controls *which* experts their political representatives listen to. Here arises one of the most crucial questions addressed in *Science and Representative Democracy*: What is a citizen to do when there appears to be *substantial disagreement among the experts*?

The possibility to provide the citizen with reliable instruments that allow her to evaluate which one of two opposite views is more reliable is an indispensable condition for the actual survival of every democracy, which is thesis T2 presented in the Introduction. It is only if we know how to choose the "right expert" or more plausibly the "right group" of experts that we can reconcile the autonomy of our decisions (Rousseau's ideal of direct democracy) with the principle of competence, invoked to justify representative forms of democracy that are made necessary by the growing specialization of contemporary sciences [p. 79].

This is the topic tackled in chapters 5 and 6.

The general thrust of Dorato's arguments in these chapters is this: Usually when there is a consensus among *genuine* scientific experts in a field, the content of the consensus can and should be assumed to be correct. Some fake controversies involve pseudo-experts who are not real scientists but pretend to offer scientific arguments or evidence, as happens with some "alternative" medical therapies. Other times there are genuine scientists on both sides; but even so, the apparent division among experts usually is a matter of true field-experts on one side, and other scientists (not true field-experts, though they may otherwise have good scientific credentials) opposing them for bad reasons. The model here is the fabricated controversy over whether tobacco smoking causes lung cancer, or the current attempts to fabricate a controversy about whether global warming is real and anthropogenic or not, which often involves established scientists from other fields such as physics. Often, Dorato claims, it is easy to see the financial or political motivations of

the side opposing the genuine expert consensus, as for example in “climate research” funded by multinational oil companies.

The case that I believe Dorato does not treat in enough depth is perhaps rare, but something that does happen: when *genuine* field-experts are *strongly* in disagreement about an issue that is important to the public and to government policy. In some such cases there simply will not be a consensus among the scientific experts, and so Dorato’s prescription to epistemically defer to the consensus of the experts is not applicable, either for citizens or politicians. But in other cases there may exist something that *looks like* a consensus, even though no such thing is epistemically warranted.<sup>1</sup> The history of medicine can supply many examples of such a situation where the apparent consensus eventually proved wrong. But we need not go far back in time to find some important ones, because this happened repeatedly during the recent Covid-19 pandemic. Take for example the initial apparent consensus in the medical community that the Covid-19 vaccines would *substantially* prevent SARS-Cov2 infections and hence prevent transmission of Covid-19. This was a belief that grounded the unprecedented policy decisions to impose vaccine mandates on many categories of workers, and to implement a vaccine “passport” system that substantially limited the rights of those who declined the vaccinations. But before the end of Summer 2021 the Delta variant had shown that vaccine effectiveness against infection was waning rapidly and that “breakthrough” infections would become increasingly common; and in December 2021, the Omicron variant quickly put to rest any hope that transmission could be controlled through vaccination. This confirmed the predictions of many virologists and immunologists, genuine experts in coronavirus transmission, who had all along expected protection against infection to be imperfect and short-lived. But the voices of such scientists had been mostly silenced or marginalised, at least in the sphere of public discussion in the media and social networks.

A case like this falls under the category, whose existence Dorato acknowledges, of cases in which the consensus of scientific experts proves to have been wrong. We may hope, as Dorato does, that these cases are rare enough that their existence does not undercut the reasonability of the general epistemic practice of “Trust the genuine scientific experts when there is a consensus among them”, which is central to Dorato’s vision of a well-ordered relationship between science and democratic society. But the above-mentioned case from the Covid-19 pandemic shows that it might be advantageous to democratic society to have control

mechanisms of some sort that prevent an *appearance* of expert consensus from being too easily or too quickly generated.

To return to the easier cases of disagreement among experts, where there is a distinct and important difference between the field-experts on one side and the contrarian scientists on the other, chapter 6 offers a prescription for how ordinary citizens can distinguish which group is (at least *ceteris paribus*) more deserving of trust. Here, Dorato points out, the internet can be a genuine aid to the functioning of democratic societies, rather than just a noise-filled font of disinformation and misinformation, because it is possible very rapidly to check the credentials of someone put forward as an expert. We can look for their CV, and look for their employment history, for example: has this scientist obtained a PhD in a *relevant* discipline, from a reputable university? Have they had academic papers accepted for publication in reputable international journals? Does a Google search reveal any links or connections that might indicate financial motives for espousing a certain controversial claim? And so on.

This is an excellent point, but as Dorato realises, such an epistemic control-check is not as easy for the average citizen to do effectively as it is for most readers of this article. This brings us to the final chapter, chapter 7, where Dorato argues compellingly for the crucial importance of improving the overall scientific literacy of the public. This is not primarily a matter of mastering a greater quantity of the *contents* of disciplines such as biology, physics or chemistry, but rather a matter of making sure that citizens understand much better *how science works* and *why science works* (to the extent it does). It is also a matter of ensuring that most citizens have the basic skills needed to understand statistical and probabilistic statements made by scientists, and to spot both logical and probabilistic fallacies. And Dorato argues, forcefully and correctly in my view, that for *this* kind of basic scientific education, important doses of history of science and of philosophy of science are indispensable components of the necessary education.

*Science and Representative Democracy* is an elegantly structured and carefully argued book that presents an optimistic vision of how individual autonomy and representative democracy can coexist, and even thrive, in this day and age in which scientific knowledge is ever more relevant for political and personal decision-making.

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## NOTES

<sup>1</sup> This can happen, for example, when the media widely present and implicitly endorse the apparent-consensus view without giving much, if any, time to the dissenting view. This *may*, but *need not*, involve any bad motivations or misconduct, on the part of the media or the apparent-consensus scientists.