Public Reason, Values in Science, and the Shifting Boundaries of the Political Forum

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Abstract: A consensus is emerging in the philosophy of science that value judgements are ineliminable from scientific inquiry. Which values should then be chosen by scientists? This paper proposes a novel answer to this question, labelled the public reason view. To place this answer on firm ground, I first redraw the boundaries of the political forum; in other words, I broaden the range of actors who have a moral duty to follow public reason. Specifically, I argue that scientific advisors to policy makers have that duty—a duty that is needed to create a barrier against any nonpublic values that scientific researchers might let enter their work. Next, I specify how scientific advisors should approach value judgements to satisfy public reason, arguing that they should work within a conception of justice that is political and reasonable in several distinct senses. Scientific researchers at large should instead communicate their value judgements by following norms of transparency that facilitate scientific advisors' public reasoning. Finally, I contrast my account with the dominant response to the which-values question, which focuses instead on citizens' values, demonstrating that that response shares several problematic features with the heavily criticised external conception of public reason.

Which values should scientists use to determine whether mask mandates slow the spread of a virus? Which values should they use to determine when, if ever, a carcinogenic substance is safe? Which values should they use to predict precipitation patterns in the future? More generally, which values should scientists use to answer questions about policy-relevant matters of fact? My primary goal in this paper is to develop a novel answer to this question, centred on public reason, and defend it against the currently dominant family of responses focused on citizens' values. To place this answer on firm ground, I also need to pursue a second goal: to redraw the boundaries of the political forum from the standpoint of public reason liberalism. At least when they provide advice to policy makers, scientists belong in that forum and are therefore morally required to engage in public reasoning.

To some readers, the primary question this paper tackles might seem misguided. Surely, scientists should investigate factual matters like those listed above based on no values at all. However, philosophers of science talk of a 'near consensus' emerging in their field about the unavoidability of *non-epistemic* value judgements, not only when it comes to deciding which

scientific problem a research team should investigate next, what lines must not be crossed in dealing with research subjects, and how scientific findings should be applied in society but also at the very *core* of scientific inquiry (Lusk, 2021, p. 102).[1]

This near consensus draws on an argument stressing the ineliminability from science of inductive risk—'the chance . . . of getting it wrong in an inductive context' (Douglas, 2017, p. ix).[2] The prototypical type of inductive risk concerns the leap that researchers need to take to fill the gap between their evidence base and any general conclusion, given that empirical observations necessarily underdetermine the truth of such conclusions. Purely epistemic values such as the accuracy and explanatory power of one's theory, which are thought to help produce true knowledge, are insufficient to fill that gap. Scientists are forced to reach further—for example, for moral or political values—to decide how much evidence is sufficient to assert, say, that mask mandates slow the spread of COVID-19. To avoid making an arbitrary choice of evidentiary threshold, they need to consider how others are likely to apply their conclusions, balancing the broad disvalue that would be generated by a false positive against the disvalue of a false negative (Rudner, 1953).

Researchers need to make other difficult, value-laden calls earlier in their work—for example, when characterising evidence. In Heather Douglas's (2000, pp. 569-72) famous example, toxicologists studying dioxins had no choice but to reach beyond epistemic considerations when deciding whether to classify as cancerous many rat-liver slides that showed only borderline signs of a cancerous lesion. Another such call concerns the simplifying choices integral to the construction of numerical simulation models—used, for example, to predict the impact of climate change on future precipitation patterns—which cannot be verified empirically. It is always possible that 'two or more errors in auxiliary hypotheses may cancel each other out', leading to a misleading match between a model's predictions and available observations (Oreskes et al., 1994, p. 642). Also, two alternative models might both receive support from the data, but in different areas: one might better predict gradual change, while the other better predicts rapidly developing extreme events. Consequently, scientists need to reach into non-epistemic territory to decide in which area their model should be more accurate; when it comes to choosing between the two models, much depends on how much of a priority preparing for worst-case scenarios should be (Intemann, 2015, pp. 219-20).[3]

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[1] See also Schroeder (2021, p. 546). From this point on, non-epistemic values are referred to as values, for short.
[2] The arguments that good science requires value judgements are not limited to the one centred on inductive risk. For example, some stress the importance of 'thick concepts' that mix descriptive and evaluative content, as with 'danger' (Putnam, 2002).
[3] Some would object to extending the term 'inductive risk' beyond hypothesis acceptance or rejection, proposing that 'epistemic risk' be used to describe all the other calls scientists might get wrong (Biddle and Kukla, 2017). However, nothing in my argument depends on adopting either terminology.

Providing novel support for the much-rehearsed inductive-risk argument against the value-free ideal of science falls beyond the scope of my paper. I take as given the near consensus on the erroneousness of that ideal and instead investigate what it means to take the near consensus seriously in two crucial areas.[4] The first area concerns public reason liberalism, which requires that political decisions be justifiable across a wide range of religious, philosophical, moral, and to some extent even political views. Section 1 presents the approaches to public reason that build on the work of John Rawls, paying special attention to their analyses of science and emphasising that they all ignore the role of values in scientific reasoning. Sections 2 and 3 argue that once that role is acknowledged, scientific advisors to policy makers cannot be considered part of the background of the political forum any longer and should be called upon to follow public reason.[5]

The second area concerns which values should influence science—or, in other words, whose values should guide scientists. Section 4 develops my original public reason view of the matter, which requires scientific *advisors* to draw on a conception of justice that is political and reasonable in a few distinct senses. Although scientific *researchers* are not bound by this requirement, they are not off the hook; they should communicate their value judgements by following certain norms of transparency that facilitate scientific advisors' public reasoning. Section 5 criticises the dominant approach to the which-values question, which posits that scientists should rely on citizens' values. Specifically, I attack that view by demonstrating that it shares problematic features with the heavily criticised external conception of public reason liberalism. Next, I suggest that my view can be made even stronger (while keeping its defining features) by specifying it in a way that captures some of the democratic commitments animating the citizens'-values approach.

1. Rawlsian public reason liberalism and science

Rawls's public reason liberalism is an extremely influential theory of legitimacy in political decision-making. It focuses on the 'fact of reasonable pluralism'—that is, the inevitable proliferation of a wide variety of beliefs about religion, morality, philosophy, and other

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[4] This consensus is not completely without critics, such as Betz (2013). For a few objections to Betz, see Havstad and Brown (2017) and John (2015a).

[5] This paper focuses exclusively on Rawlsian 'consensus' public reason liberalism, excluding so-called convergence models epitomised by the work of Gerald Gaus (2011). In part, this is because of my idea that the entanglement of science and values has interesting implications for the political forum as understood specifically by Rawlsian scholars. Also, in contrast to the convergence camp, Rawlsian public reason liberals devote considerable attention to science, providing a useful springboard for my answer to the which-values question. While any proper assessment of the relative merits of these two approaches falls outside the scope of this paper, Hartley and Watson (2022) and Lister (2018) provide a few strong arguments supporting the Rawlsian camp. Also, Rawlsian public reason liberalism is the target of powerful objections above and beyond its clash with convergence theories. For an exploration of many of them and some replies, see Quong (2022).

'comprehensive' matters in the absence of state oppression of unorthodox doctrines (Rawls, 2005, pp. 54-58). Reasonable pluralism poses a huge problem for Rawls's own principle of legitimacy, which requires that at least the most important terms of social cooperation be justifiable to all citizens who are committed to this process of mutual justification (Rawls, 2005, pp. 135-37). How can there be any cooperative arrangements that are so widely justified if individuals disagree with each other so much?

According to Rawls, a liberal democratic order can still be legitimate despite reasonable pluralism, provided that political decisions are made through public reason. Importantly, the application of this public reason requirement is limited in a few important respects. Most relevantly here, it only creates moral (as opposed to legal) obligations for certain actors, or, in Rawls's language, it only applies within the 'public political forum'. This forum includes judges, legislative chambers, and chief executives as well as ordinary citizens when voting in elections, candidates for elections, and groups participating in electoral campaigns. Individuals operating outside this forum–for example, within their church or university–are not bound by public reason (Rawls, 1997, pp. 767-68; Rawls, 2005, pp. 215-16).

At least when constitutional essentials and issues of basic justice are at stake, each individual acting within the political forum must bring together two kinds of inputs to identify what decisions can be backed by authentically public reasons (and then they must refrain from supporting any position for which they have no public reason while advancing at least one public reason for any decision they support) (Rawls, 1997, pp. 773-80; Rawls, 2005, pp. 223-27). The first kind is one's preferred conception of social justice, provided that it can be given a political form and therefore be presented independently of any wider comprehensive doctrine one might hold. Moreover, in its political form this conception must be built on a few basic reasonable ideas: that society should be a mutually acceptable system of cooperation among all persons considered as free and equal; and that the 'burdens of judgement' naturally affecting our reasoning capacities make pluralism inevitable in the absence of oppression.[6] Crucially, these basic ideas are compatible with a wide range of otherwise mutually inconsistent comprehensive doctrines different persons might hold. Also, Rawls (1997, pp. 773-75) suggests that although individuals disagree over what principles of justice best specify the basic ideas defining reasonableness, accepting such ideas involves endorsing one liberal conception of justice out of a family of them. Therefore, those basic reasonable ideas and the commitment to a liberal democratic order that follows from them are widely acceptable in society, making any political decision backed by public reasons legitimate despite reasonable pluralism.

However, by themselves reasonable principles of justice are insufficient to identify what position about a concrete political issue follows from those principles and, in turn, to decide on

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[6] For Rawls's definition of reasonableess, see Rawls (2005, pp. 48-58).

that issue as legitimacy requires. Public reasoners need a way to determine 'whether substantive principles properly apply and to identify laws and policies that best satisfy them' (Rawls, 2005, p. 224). Rawls (2005, p. 224) restricts this, the second kind of input into public reasoning, to 'presently accepted general beliefs and forms of reasoning found in common sense, and the methods and conclusions of science when these are not controversial'. Therefore, science plays a key role, unlike, for example, any religiously derived cosmology. It is needed to provide actors in the political forum with the 'information' necessary to apply their principles of justice to concrete issues (Rawls, 2005, p. 223).

Rawls's discussion of science is brief. Luckily, there has been a recent surge of attention to this area by public reason liberals, who concentrate on two issues. First, they aim to justify a crucial point that Rawls appears to assume without argument: that science is not simply the perspective from which the followers of one comprehensive doctrine among others look at the world—and therefore it rightly belongs in the scope of public reason. For me and Matteo Bonotti, that is because very different comprehensive doctrines are compatible with the abstract evaluative standards that should guide scientific inquiry, such as accuracy and fruitfulness (Badano and Bonotti, 2020, pp. 49-56). Cristóbal Bellolio (2019) argues that scientific methods provide a more systematic and nuanced version of commonsense reasoning, which all human beings share, while Klemens Kappel (2021, p. 632) stresses that scientific institutions have proved themselves to be objectively the most reliable sources of knowledge available.

Second, public reason liberals critically discuss the noncontroversiality requirement that Rawls applies to scientific opinions. While some ditch this requirement altogether (Badano and Bonotti, 2020, pp. 63-64; Dahlquist and Kugelberg, 2023), others argue that wide consensus within the relevant scientific community is indeed necessary for an expert opinion to be rightfully fed into public reasoning (Bellolio, 2018; Kappel, 2021; Reid, 2019)—or even that consensus is required also in society at large (Jønch-Klausen and Kappel, 2016, pp. 121-24).

Importantly, underlying all these arguments is a one-dimensional picture of the proper functioning of scientific inquiry, which is described as trading in factual knowledge without any mention of values—a picture that, as seen in the introduction, is incomplete. For example, the full list of accessible standards governing scientific research provided by me and Bonotti is exhausted by accuracy, consistency, scope, simplicity, and fruitfulness, which are classic examples of the epistemic values that philosophers of science broadly agree are insufficient. In general, science is routinely described as feeding 'factual propositions' into public reasoning (Dahlquist and Kugelberg, 2023, p. 10), providing 'factual input' into it (Kappel, 2021, p. 621), indicating 'which facts should be treated as fixed' (Reid, 2019, p. 496), or settling relevant 'factual disagreements' (Bellolio 2019, p. 213). In itself, describing the task of science as reporting facts is not a problem. However, these public reason liberals make no mention of the

role of values in enabling scientists to make all those decisions, described in the introduction, about what should be regarded as facts here and now, given the available evidence and ineliminable uncertainty.

2. Scientific advisors: inside or outside the political forum?

The goal of this section is to argue that once we accept the ineliminability of values from science, public reason liberalism's account of the boundaries of the political forum should be revised. Before turning to that goal, however, I need to clarify how my argument relates to other features of the theories introduced in the last section.

My argument is neutral on two important issues. First, regarding scope, Rawls concentrates on how public reason applies to constitutional essentials and issues of basic justice. In one place, he states that public reason should only regulate discussions about those matters (Rawls, 2001, p. 91), while elsewhere he claims that the applicability of public reason beyond them is a complex issue that deserves further analysis (Rawls, 2005, p. 215). After conducting such analysis, some conclude that all laws and policies should be decided through public reason (for example, Quong, 2011, pp. 273-87).[7] While I am sympathetic to this broad view of the scope of public reason, I do not need to take a stance here.[8] Even on the narrow view, some scientific advice concerns political issues–having to do with constitutional essentials or basic justice–that fall within the scope of public reason. The supporters of that view can take the normative principles I propose as applicable to those issues.

Second, we have seen that some authors have investigated what gives science a role within public reasoning. To make this paper's argument as widely acceptable as possible, I consider expert opinions to belong in public reason but I do not choose between the justifications offered by Kappel, Bellolio, and me and Bonotti. Crucially, these justifications are not threatened by my rectification of their authors' understanding of science. Appreciating the consequences of inductive risk–and thus that values are needed for scientists to navigate uncertainty at several junctures–does not prevent us from agreeing with Kappel that science allows us to have 'as accurate and robust empirical information as we can' (Douglas, 2021, p. 68).[9] The inductive character of commonsense reasoning guarantees that inductive risk affects it too, reinforcing the continuity stressed by Bellolio between science and common sense. Finally, in our joint work, Bonotti and I only mention epistemic standards of inquiry. However, to keep scientific reasoning accessible and therefore public on our understanding of these concepts, it is enough to complement those standards with values that are similarly accessible, as I do in section 4.

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[7] Bellolio (2019, p. 213) agrees with this conclusion.
[8] Similarly, Kappel (2021, p. 621n2) remains neutral on the issue of scope.
[9] See also Pamuk (2021, pp. 13-14).

Rawls's noncontroversiality requirement for scientific opinions differs from the two issues I have just discussed in that my argument cannot remain neutral on it. Specifically, the idea that good science involves value judgements weighs in favour of the public reason liberal accounts that reject that requirement outright. As stressed by Douglas (2021, pp. 1–2, 132–37), given that there are multiple plausible positions about values, the value-ladenness of science provides one more reason to expect pervasive disagreement among scientists. Section 4 explains that public reason allows scientific advisors latitude in picking the conception of justice from which they select value judgements. Reasonable disagreement might even arise when applying the same conception. Therefore, my public reason view of values in science is certainly not meant to eliminate conflicts among views–not even, say, within the same advisory committee. Voting might be necessary for a committee to reach a decision on some issues.[10]

We can now turn to the question of the political forum. Here I aim to show that complicating public reason liberalism's picture of science in the above manner requires us to stretch the boundaries of that forum so as to include *scientific advisors to government*. Many channels exist for scientific advice by experts, who should be selected for their distinguished scientific contributions. Advice is often, but not always, delivered by a (usually interdisciplinary) committee. Advisory committees normally operate at the national level, as exemplified by the US National Academy of Sciences, which appoints over six thousand experts a year, on multiple committees, to inform policy makers on many issues.[11] However, committees can also be multinational, as with the Intergovernmental Panel on Climate Change (IPCC) and its effort to systematically review all relevant scientific literature for use by national governments. Besides relying on institutions providing advice through time, governments might appoint ad hoc committees that advise them on a specific issue and then disband, as generally happened in the field of climate science before the IPCC's creation. Although National Academy of Sciences committees, the IPCC, and many other committees publish reports, some operate like the UK's Scientific Advisory Group for Emergencies (SAGE), providing 'advice for crises' by working with politicians and feeding them their assessment of the latest scientific knowledge on an ongoing basis (Douglas, 2021, p. 82).[12] Finally, there are one-on-one advisory arrangements like those epitomised by chief scientific and medical officers, whose job also largely consists in ongoing exchanges with politicians.

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[10] This point about the pervasiveness of expert disagreement is in line with recent work in democratic theory. Democratic theorists investigate how best to publicise the disagreements occurring within scientific advisory bodies–for example, by making votes public (Moore, 2017, pp. 130–34) or even by drafting minority opinions (Pamuk, 2021, pp. 83–87). Although their proposals seem compatible with public reason, I do not argue that point here.

[11] https://www.nasonline.org/programs/science-society/national-academies-studies-reports/ (accessed August 1, 2024).

[12] To be precise, some committees work in contact with policy makers outside of crisis situations, as with the Council of Science and Technology in the UK.

Encompassing all this variety, scientific advice can be defined as advice meant to help 'policymakers make sense of what to think about the available evidence' (Douglas, 2021, p. 80). Advisors are supposed to provide the best possible picture of policy-relevant facts without advocating any policy positions (Pamuk, 2021, pp. 67–68). Also, they are supposed to assess existing knowledge, as opposed to conducting fresh scientific research (Oppenheimer et al., 2019, ch. 6). These are fine-line distinctions, and real-world advisors often cross those lines (Jasanoff, 1990). However, my goal here is to explore what we should make of scientific advice from the perspective of public reason liberalism, not how it works in real-world practice.

As we have seen, Rawls excludes scientific advisors from the set of actors required to abide by public reason. My argument is that once we acknowledge the inextricability of values from science, that exclusion loses its most obvious justification. By definition, the content of any public reason brings together facts and values. Therefore, public reason liberals' neglect of the role of values in science enables them to think of advisors as mere providers of raw material (factual statements based on empirical evidence assessed with purely epistemic criteria) that is necessary for *others* to engage in authentic public reasoning by combining that material with values.

However, we have seen that the conclusions of any scientific study on, say, the impact of lockdowns on the spread of COVID-19 might have been significantly affected by researchers' value-laden choices, which are necessary to establish the facts. Given that they aimed to evaluate whether and in what way they should rely on individual studies, advisors determining what was the best available knowledge on COVID-19 and lockdowns needed to mix epistemic and value considerations in the same manner as researchers. Furthermore, in their capacity as communicators, they also needed to combine those considerations in another way. Indeed, advising policy makers creates further dilemmas for scientists, who need to decide when to present a crude picture of information they know to be more complex in order to facilitate understanding and uptake by their lay audience (Steele, 2012). Neither the negotiation of this trade-off between accuracy and usability nor the choice of what to leave out of any simplified picture can be made without value judgements (Pamuk, 2021, pp. 70–75). This completes the first step of my argument for stretching the boundaries of the political forum: establishing that scientific advice has *the right content*, mixing factual knowledge and values like public reasoning does.

The second and final step concerns *the need to avoid rule by nonpublic values*. The value judgements included in the scientific opinions fed to policy makers risk determining policy decisions to some extent. As discussed in the introduction, values play a legitimate role in many decisions that are underdetermined by epistemic considerations but which scientific researchers need to make. Crucially, such value choices can affect the conclusions reached in

individual studies (Schroeder, 2019, pp. 546–48). Additionally, we have just seen that advisors' task of communicating with policy makers involves more value judgements, further increasing the impact of value judgements on the picture of the facts they present. Consequently, even if advisors refrain from advocating any specific policy, the decisions made by a government that takes science seriously might be shaped significantly by the value-laden choices scientists made during their research and then while assessing available knowledge and preparing to communicate. To give a stylised example of the impact of some of those choices, imagine that at some point in the COVID-19 pandemic, SAGE was asked to consider whether a lockdown was still necessary to keep the reproduction number (R) of the virus below 1. Imagine also that SAGE decided to put a premium on the interests of industry, therefore prioritising avoiding a false positive over avoiding a false negative in deciding, among other things, what evidentiary threshold should be met to accept the continued necessity of a lockdown. At least in certain phases of the pandemic, depending on how high that premium was, it might well have contributed to determining SAGE's conclusion that a lockdown was no longer necessary. In turn, if keeping R below 1 was indeed a government priority, SAGE's value choices might then have made a difference to the government's choice to lift the lockdown.

Philosophers of science worry about these sorts of cases because the impact of the values of advisors is often unrecognised. Another worry is that if advisors are free to pick any values they like, inappropriate values (say, absolute priority to the interests of industry) might shape the policies (for example, lockdown removal) that policy makers adopt.[13] As explained in the previous section, public reason liberalism maintains that as a matter of legitimacy, at least the most important political decisions must be made through public reason and therefore grounded in certain (political and reasonable) values. If comprehensive or unreasonable values are allowed to influence the picture of available evidence portrayed by advisors, policy makers might make decisions whose justification depends on facts that are partly based on the wrong sorts of values, contradicting public reason. Therefore, it is necessary to mandate that scientific advice be generated from within public reason in order to create a barrier against illegitimate influences over political decisions—that is, any comprehensive or unreasonable value judgements made by scientists that might 'tilt the playing field' towards one such decision over its alternatives (Schroeder, 2017, p. 1048).[14]

3. Embracing a lively background culture and a division of public-reasoning labour

The last section's argument raises two worries. In answering them, this section aims to provide a fuller picture of my proposal to stretch the political forum by clarifying, among other things,

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[13] See, for example, Douglas (2005, pp. 154–57).
[14] Section 4 clarifies why, as non-experts, policy makers cannot erect that barrier themselves.

why scientific advisors are bound by public reason but scientific researchers are not. First, including any actor in the political forum means removing them from the 'background culture of civil society'—that is, the settings in which individuals are morally allowed to gather to discuss any issue, political or otherwise, from whatever perspective they prefer. Rawls (2005, p. 220) states that scientists ('universities, scientific societies and professional groups') belong to that culture. Also, he provides two powerful reasons why this space of freedom from public reason's strictures is important. The first reason is that some background-culture associations provide perfect forums to discuss how different comprehensive (in particular religious) doctrines can support the basic ideas of persons, society, and reasonable pluralism that define political reasonableness. In turn, these discussions help stabilise liberal institutions (Rawls, 2005, pp. 151n16, 249). The second reason is that a space for fuller and more experimental conversations than allowed by public reason is needed for new ways of thinking about the common good to start emerging (Rawls, 1997, p. 768n15). Historically, that sort of space produced the women's movement and other innovative social movements that later developed their ideas into new, full-blown reasonable conceptions of justice (Rawls, 1997, p. 775n28).

Given these two reasons, would not the removal of scientific advisors from the background culture come at too high a price? The first reason applies primarily to churches, although religiously affiliated universities represent another forum in which students and staff can explore which intellectual resources offered by the religion in question support reasonable principles of justice. Given that some scientific research is conducted within universities, this function of religiously affiliated universities would create some difficulties for any theorist aiming to include scientific *research* in the political forum. However, the foregoing section merely argued that *advice* should be included, sidestepping those difficulties altogether. Similarly, my focus on advisors allows me to preserve a dynamic space in which innovative perspectives on the common good may emerge. Rawls claims that universities play a crucial role in that space, and arguably so do scientific societies and professional groups (which he mentions generically). Limiting the strictures of public reason to scientists wearing their hat as advisors leaves those associations largely in the background culture, free to play their part.[15]

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[15] Additionally, distinguishing between advisors and researchers makes my account hospitable to the view that (as far as possible) value judgements should not be left to individual scientists and should rather be made by scientific communities, which, for example, generally set the statistical significance threshold at 0.05 or 0.01. Specifically, my account fits neatly with a particularly nuanced version of this view, proposed by John (2015b), that highlights how *researchers* need fixed standards because of the need to achieve coordination and because research has many possible legitimate audiences. Therefore, it is virtually impossible to anticipate the possible impacts of one's assertions across all of them. However, John maintains that these reasons do not apply as strongly to *advisors*, who should therefore make their own value judgements. Consequently, John's view is compatible with the requirements that the next section suggests should be imposed on individual advisors.

The second worry highlights that although the constitutive components of the reasoning behind scientific advice (that is, value and factual judgements) are the same as those of public reason, they are combined differently. Public reasoning is classically presented as meant to determine which law or policy best satisfies one's preferred reasonable principles of political justice. In contrast, public reason liberals need from scientific advisors the best available account of the factual information needed to apply principles of justice–complete with value judgements made whenever epistemic considerations do not suffice. Even if those value judgements were political and reasonable, would not advisors' assessment of available knowledge be too eccentric to count as public reasoning?

This eccentricity is not a problem, because it simply reinforces an element of Rawls's theory: a division of labour internal to public reasoning. At least based on some passages in Rawls's work, the classic picture of the content of public reason presented in the previous paragraph applies only to legislators, government executives, and possibly candidates for election and campaign managers. Indeed, we must discern 'how the ideal of public reason applies' to different actors in the political forum (Rawls, 2005, p. 215). Importantly, this ideal applies 'in a special way' to judges and particularly to supreme courts (Rawls, 2005, p. 216). Judges are not morally allowed to draw on their preferred conception of justice; talking about supreme court judges, Rawls claims that decisions must be reached (and supporting arguments formulated) with exclusive reference to the specific reasonable conceptions of political justice that (based on their interpretation) animate the relevant constitutional materials (Rawls, 2005, pp. lv, 235-37). Turning to ordinary citizens deciding whom to vote for, in one place Rawls clarifies that their task is largely negative–to merely 'repudiate' any candidates who transparently violate public reason (Rawls, 1997, p. 769).[16] In sum, different actors are already expected to perform considerably different tasks that, however, all count as public reasoning. Including in the political forum advisors reconstructing for other public reasoners the state of knowledge relevant to political issues simply develops this division of labour in yet another direction.

4. Which values should guide scientists? The public reason view

My proposed expansion of the political forum should be intrinsically interesting to public reason liberals, but it is also instrumentally important. I have established that scientific advisors are required to follow public reason, which prepared the ground for my *public reason view* (PRV) of a difficult question about values in science. Given that values need to enter scientific work, which

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[16] In the same place, he also states that citizens who engage in (but do not manage) electoral campaigns do not have to obey public reason (Rawls, 1997, p. 767n9). Admittedly, however, elsewhere Rawls (2005, p. 215) gives a more positive role to ordinary citizens, who are said to be bound by public reason when they engage in political advocacy.

values should guide scientists? In other words, whose values are morally allowed to influence them—the scientists' personal values, the general population's shared priorities, or principles from some other perspective? As far as scientific advisors in particular are concerned, public reason provides them with the values. This section explains that this means that values need to be (i) political, (ii) built on reasonable foundations, and (iii) arranged in a reasonable order of priority. Also, it explores what scientific researchers are required to do to facilitate advisors' public reasoning.

Public reason requires that value judgements be based on a conception of justice that satisfies a few requirements. As mentioned in section 1, the first requirement is that it be *political*. This means that it should be 'freestanding' (Rawls, 2005, p. 12)—that is, it should be possible to present it (and the value judgements made on its basis) during public reasoning independently of any comprehensive doctrine that brings together, in a broadly unified system, politics and God, the good life, and all sorts of other belief areas.

This requirement provides guidance to advisors. Any value judgement that stands or falls with any comprehensive doctrine is unjustifiable across the countless comprehensive views in society and should be avoided. For example, a certain conception of the place of human beings in the universe is a major driver of opposition to genetically modified organisms (GMOs). According to this conception, GMOs pervert the natural order, which should be preserved, and producing them is an unacceptable act of hybris (Dürnberger, 2019). This controversial view of our place in the natural order is a classic comprehensive notion, which should be ignored, say, by any advisors tasked by their government with publishing a review of the negative effects of genetically modified crops. In contrast, the idea, highlighted by Justin Biddle (2018, p. 367), that genetically modified crops might pose a risk of 'consolidation of power over agricultural research, products, and methods in the hands of a few multinational corporations' does not depend on any comprehensive doctrine. Consequently, the political nature of public reason's values does not exclude that risk from the proper bounds of the review; and for Biddle, excluding that risk would pose the inductive (or, in his terminology, 'epistemic') risk that the government will later refrain from commissioning further research on important effects of GMOs that are currently misunderstood.

Besides being political, conceptions of justice must be reasonable in two ways. First, they must have *reasonable foundations*. When presented as freestanding from any comprehensive view, advisors' conceptions of justice should ultimately rest on (and aim to best specify) a few political ideas which jointly define political reasonableness: 'the underlying ideas of citizens as free and equal persons and of society as a fair system of cooperation' to everyone's benefit together with the acknowledgement of reasonable pluralism (Rawls, 1997, p. 774).

To illustrate what violating the reasonable-foundations requirement might mean, think of any (implicitly or explicitly) discriminatory value judgement (against any social group) that could shape scientific work. For example, medical researchers were unusually slow in turning their attention to AIDS in the first months of the epidemic in the US. This led several activists and scholars to think that 'no one cared because it was homosexuals who were dying' (Shilts, 1987, p. 95)—an apathetic attitude that is equivalent to unreasonably considering the gay community as less than equal citizens, undeserving to share equally in the fruits of social cooperation (and specifically of medical research).[17]

Second, conceptions of justice should set *a reasonable order of priority* for trading off conflicting values. As mentioned in section 1, given the burdens of judgement, different individuals sincerely trying to provide the best specification of the basic ideas defining reasonableness are likely to end up with different conceptions of social justice, which are all allowed in public reasoning. However, the resulting conceptions will share three broadly liberal democratic features:

> First, a list of certain basic rights, liberties, and opportunities (such as those familiar from constitutional regimes);
> Second, an assignment of special priority to those rights, liberties, and opportunities, especially with respect to the claims of the general good and perfectionist values; and
> Third, measures ensuring for all citizens adequate all-purpose means to make effective use of their freedoms. (Rawls, 1997, p. 774)

Although a complete account of how to prioritise values is left to each reasonable conception of justice, these three features (and especially the second one) shared by all reasonable conceptions already provide crucial guidance to scientific advisors.

To illustrate, take an important study by Deborah Kaminski and Cheryl Geisler (2012) that finds no gender disparities in retention and promotion among STEM faculty—a study conducted against the backdrop of scholarship that generally finds that bias against women does exist. Robin Andreasen and Heather Doty (2017, pp. 135–37) scrutinise Kaminski and Geisler's data, investigating whether it shows gender parity in retention, understood as the percentage of staff

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[17] Perhaps surprisingly, neither of the examples illustrating public reason's first two requirements focuses on a classic inductive-risk case. Inductive risk is particularly important to demonstrate that even the core of science, concerning evidence gathering and hypothesis acceptance, is necessarily value laden. Still, as mentioned in the introduction, values should play a role also at the periphery of the scientific process. Examples include the choices of what should be studied next, as in the AIDS case, and of the right scope for one's study, as in the GMO case. I do not have space to provide a taxonomy of those examples beyond the one outlined in the introduction, but see Elliott (2017) for a discussion of a wide range of cases. Having said this, inductive risk remains extremely important. Indeed, my discussion of GMOs touches on inductive risk, and the example illustrating my third requirement focuses exclusively on it.

retained during the duration of the study. Although merely 41 percent of women were retained against 47.2 percent of men, Andreasen and Doty note that this difference might be statistically nonsignificant. They demonstrate that in this case, statistical significance is partly determined by non-epistemic choices about (i) what to conclude if a study's p-value is exactly the same as the customary significance threshold of 0.05; and (ii) whether significance should be tested using the chi-square test or Fisher's test, which are both accurate in this context but tend towards false positives and false negatives, respectively. Any non-arbitrary approach to making such choices hinges on whether the cost of falsely accepting that there is a problem of gender discrimination in STEM departments (for example, heavier taxation to finance 'needless expenditure on programs to increase retention for women') outweighs the cost of falsely rejecting it ('allowing a retention disparity to exist' and therefore letting a problem of formal equality of opportunity continue) (Andreasen and Doty, 2017, p. 136). Given that the Fisher's and chi-square tests' respective p-values for the result in question are 0.05 and 0.047, prioritising the avoidance of false positives favours considering p = 0.05 nonsignificant and picking Fisher's test over chi-square, thereby finding no statistical significance in the measured disparity in retention.

Here Andreasen and Doty draw the noncommittal conclusion that depending on your priorities, Kaminski and Geisler's (2012) data might or might not show gender disparity in the percentage of staff retained. The PRV works differently, at least if we imagine that Kaminski and Geisler's data are being assessed by scientists who, say, are working on a policy report for the US National Academy of Sciences about gender parity in higher education. As seen above, the reasonable-order-of-priority requirement calls on advisors to assign priority to 'rights, liberties, and opportunities' over 'claims of the general good'. While fighting bias holding women back in their careers falls in the basket of opportunities, the efficient use of state funds and reluctance to raise more taxes belong in the general-good basket. Consequently, advisors should make a choice between Fisher's test and chi-square and about p = 0.05 situations that prioritises avoiding false negatives and thus consider the gender disparity mentioned above as statistically significant.[18]

In sum, whenever scientific advisors need to decide whether (and in what way) to simplify complex evidence or otherwise make new value judgements, they should draw on a conception of justice that is (i) political, (ii) built on reasonable foundations, and (iii) arranges values in a

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[18] For similar reasons, the PRV requires that the value conflict between 'harm' to public health and 'economic costs' to industry, which Douglas (2000, p. 571) identifies as crucial to handling inductive risk in her famous dioxin case, should be resolved by advisors by assigning some priority to the former over the latter.

reasonable order of priority.[19] For now, let us say that each advisor is free to select their preferred conception that satisfies requirements (i)–(iii), although section 5 introduces further constraints applying to specific kinds of advisors. There are several ways in which a conception might fail requirements (i)–(iii). Consequently, public reason imposes 'considerable discipline on public discussion' (Rawls, 2005, p. 227), in our case by acting as a 'filter' on the frameworks within which advisors can approach value judgements (Quong, 2011, p. 207). At the same time, (i)–(iii) allow public reasoners decent latitude in picking their conception, which importantly suggests that the idea that values should be political and reasonable does not silence *too many* perspectives. For example, Rawls (1997, pp. 774–75) stresses that the priority rules mandated by (iii) are compatible with many accounts of economic justice, including his favoured conception of justice as fairness (which severely limits economic inequalities), centrist Christian democratic accounts, and, arguably, conservative conceptions including 'bleeding heart' libertarian frameworks like John Tomasi's (2012).

How about the values playing a role in the scientific studies that advisors are considering for inclusion in their picture of the available evidence? In the language of Daniel McKaughan and Kevin Elliott's (2013) model, advisors should 'backtrack' to the main value judgements influencing each study to check that they are consistent with *any* conception of justice that satisfies (i)–(iii). As explained in section 2, advisors must protect political decisions from rule by nonpublic values, including any comprehensive or unreasonable values that might have affected the conclusions of individual pieces of research. To do so, advisors merely need to ensure that the values shaping the studies they rely on are political and reasonable. In line with McKaughan and Elliott's model, if the identified values do not pass this test, advisors should 'consider how they would arrive at different conclusions . . . based on their own values and perspectives' (p. 209)–provided that those values and perspectives satisfy (i)–(iii). Those conclusions, not the original study's, should then be communicated to decision-makers.

Another point about advisors is worth mentioning before bringing the responsibilities of researchers into the picture. For Rawls, public reasoners should communicate at least one public justification for their positions. Hence, scientific advisors should do their best to be transparent about the roles that epistemic considerations and (political and reasonable) values play in justifying their picture of the facts–and about why, especially in fast-moving crisis situations, their advice may have changed over time.[20] On Rawls's final account of discourse

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[19] Public reason is sometimes criticised for the anthropocentric focus of its notion of reasonableness (Matthews, 2023; Pepper, 2017). Therefore, one might worry that on my view, advisors are supposed to ignore animal welfare and environmental harms. However, there are many accounts explaining how Rawlsian public reason accommodates concerns for both nonhuman animals and the environment (for example, Nielsen and Hauge-Helgestad, 2022; Roberts-Cady, 2020; Taylor Smith, 2020). For reasons of space, I leave it to the reader to further explore and decide among those accounts.

[20] For more on transparency about the role of values in science, see Elliott and Resnik (2014).

ethics, provided that an authentic public reason for their position is forthcoming, public reasoners are allowed to *also* voice any comprehensive reasons they might have for it in order to increase citizens' mutual knowledge (Rawls, 1997, pp. 783–86). This is the so-called proviso, which leaves untouched the duty to only support positions that can be grounded in political and reasonable values; in turn, it leaves untouched requirements (i)–(iii) for advisors. Also, it reinforces the important point, mentioned above, that public reason is not an objectionable silencer of perspectives. Therefore, it fits well with the PRV.

What about researchers? The proponents of backtracking appeal to self-determination and the goal of fostering trust in science to argue that scientific researchers should enable backtracking by disseminating their work in a way that discloses any conflicts of interest, shares data after publication, and acknowledges both their value judgements and the frames used to make them (Elliott 2010; McKaughan and Elliott 2013). The goal of facilitating advisors' public reasoning adds further weight to their argument, and I therefore endorse the requirements they propose. Hence, even if, for example, the scientists who helped produce the COVID-19 vaccines were unlike chief medical advisors and, therefore, did not have to follow public reason, on my account they were still restricted in important ways.

Importantly, my narrow focus on backtracking by advisors protects my account from a classic objection to the backtracking model, thus buttressing my recommendation that advisors derive different conclusions from those of researchers, based on public values, when needed. McKaughan and Elliott (2013) would like policy makers and the general public to engage in backtracking. Consequently, Andrew Schroeder (2021, pp. 550–51) convincingly argues that their proposal is generally unfeasible: the interactions between epistemic considerations and the many value judgements that a study may involve are normally so complex that non-experts would be unable to determine what a study's conclusions would look like based on different values. However, on the PRV it is scientific advisors, not lay citizens, who do the backtracking.[21]

To further support the feasibility of the backtracking required under the PRV, consider another family of approaches to scientific advice. My view has important similarities with such approaches but is untouched by an important objection to them. Developed by the IPCC, the 'pragmatic-enlightened model' calls on advisors to map out all possible pathways through the evidence to different conclusions that can be charted based on alternative value judgements (Edenhofer and Kowarsch, 2015), analogously to the 'honest broker of policy alternatives' (Pielke, 2007). Given the many ways in which values enter scientific research and given the

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[21] Incidentally, Schroeder's point supplements section 2's argument that advisors are needed to create a barrier against nonpublic values and should therefore obey public reason. Indeed, it highlights the unfeasibility of an alternative approach, according to which advisors are just required to be transparent about the value judgements embedded in the information they communicate, while policy makers should determine for themselves what picture of the facts would emerge based on political and reasonable values.

complexity of their interactions with each other and with epistemic considerations, Joyce Havstad and Matthew Brown (2017) demonstrate that it is virtually impossible to complete any such map for any topic that, for example, the IPCC itself might report on. Luckily, one single pathway based on political and reasonable values is all that the PRV requires of advisors.[22]

Obviously, this does not mean that advisors can repurpose every single scientific study that was guided by nonpublic values in order to draw alternative conclusions based on political and reasonable assumptions. Imagine an advisory committee tasked by a national scientific academy to write a policy report about possible changes in a coastal area at risk of erosion. They identify, among other studies, a recent analysis of climate change in that very area that, however, was commissioned by the farming industry; its authors prioritised accuracy in predicting several variables relevant to the future of farming in the neighbouring plains to the detriment of accuracy of ocean system variables and other factors closely related to coastal erosion. It might well be that the committee should discard this study.[23] However, this poses no problem for the PRV. What else should advisors to government do with scientific studies that, because of their structure, are irrelevant to, and therefore cannot be made to serve, government's legitimate goals? At the same time, it seems intuitively wrong to suggest that no study should *ever* be shaped by the farming industry's, not public reason's, priorities. There is a place for those sorts of studies, which is part of the reason why the distinction between background culture and political forum (and the moral obligations applying to researchers and advisors) is important.

5. Against the citizens'-values view

My argument so far only demonstrates that readers who are already sympathetic to public reason should embrace the PRV of values in science. To broaden the PRV's appeal, this section contrasts it with the dominant approach to the which-values question, which might be called the *citizens'-values view* (CVV). I first suggest that arguments advanced in an important debate internal to public reason liberalism can be repurposed in a way that should give pause to any supporter of the CVV while highlighting an important strength of the PRV. Next, I show that the PRV can be further specified to incorporate some of the CVV's democratic commitments, increasing its appeal while keeping the main features introduced in section 4.

There is some variation among supporters of the CVV. Some arrive at it by reworking a less prescriptive answer to the which-values question: the so-called aims (or users) approach.

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[22] Should I not call on advisors to map out several pathways through the evidence, based on different reasonable conceptions of political justice? As suggested by Schroeder's and Havstad and Brown's arguments, mapping out one pathway is complicated enough. The requirement that advisors go through the process multiple times would risk being overly burdensome and time consuming.
[23] In a sense, the values embedded in it might be irreparably comprehensive.

On this approach, the success of scientific work depends on the aims for which its outputs are meant to be used (and whom they will be used by): scientists should provide different scientific representations of a certain phenomenon depending, for example, on whether laypersons will use them and whether they are needed quickly (Elliott and McKaughan, 2014; Parker and Lusk, 2019). Accordingly, scientists should employ the values that best promote the planned aims of their research (or the priorities of its intended users). However, in this form, the aims/users approach uncritically accepts research aims and user priorities, however problematic. Hence, some authors also require that aims and priorities be legitimate in a specific sense that I take to define the CVV at large (Intemann, 2015; Lusk, 2021).

On the PRV, the *source of illegitimacy* for scientific advisors' problematic uses of values is that those values are either comprehensive or unreasonable. In contrast, the CVV understands that source of illegitimacy as encompassing all cases in which experts, who are but a section of the population, use their own values. For instance, Greg Lusk's (2021) concern is that 'a handful of experts' (p. 104) might shape policy objectives, echoing Douglas's (2005) powerful statement that 'it is unacceptable for a minority elite to impose their values on the general populace' (p. 156). Similarly, Kristen Intemann (2015) stresses that value judgements should not be left to 'the preferences of scientists' (p. 224). Relatedly, the PRV's *ideal picture of legitimacy* is one in which the value judgements influencing the scientific opinions fed to policy makers respect section 4's principles (i)–(iii). On the CVV, that picture is one in which scientists choose values that are shared by all members of the public. For instance, Kevin Elliott (2017, p. 171) claims that scientists should choose values that reflect 'our ethical and social priorities', or, as put by Douglas (2005), values that are 'representative of the citizens as a whole' (p. 163).[24]

Of course, these authors do not expect to find complete agreement in real-world societies. Therefore, they settle for the closest possible approximation to that ideal. Talking about value judgements in the construction of numerical simulation models, Intemann (2015) maintains that legitimacy comes in degrees: 'modeling decisions can be more or less justified in degrees depending on the extent to which social and epistemological aims are clear and there is evidence that they would be broadly endorsed' (p. 228). Others outline a two-step process, asking scientists to check whether they can at least closely approximate ideal legitimacy before settling for an even less ideal solution. Elliott (2017) claims that 'when clear, widely recognized ethical principles are available, they should be used to guide the values that influence science. When ethical principles are less settled, science should be influenced as much as possible by values that represent broad societal priorities' (pp. 14–15). Similarly,

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[24] See also Schroeder's (2021) idea that the values 'held by the public or its representatives' (p. 546) should be chosen and Alexandrova and Fabian's (2022) goal of 'steering maximally close to citizen values' (p. 10n16).

Schroeder (2021) explains that hopefully a 'broad social consensus' (p. 554) will identify the relevant values, but failing that, scientists should rely on the values of society's 'mainstream'.[25]

The CVV requires a process for identifying the public's beliefs about values. Douglas (2005) and Lusk (2021) privilege deliberative exercises, while Schroeder (2021, p. 554) is open both to them and opinion surveys. However, Schroeder (2021, p. 554) underlines that some citizens hold views that are so beyond the pale that they need to be 'filtered' out of these processes to prevent unacceptable outcomes. Even if there was a broad consensus on views that are racist, misogynistic, homophobic, ableist, or otherwise in conflict 'with the foundations of democratic authority', scientists should ignore them (Schroeder, 2022, p. 1040).

In the remaining space, I cannot provide an all-things-considered argument proving that the PRV is superior to the CVV. However, I aim to take an important step in that direction by criticising the CVV's understanding of legitimacy while highlighting some crucial strengths of the PRV in that area. To develop this critique, I draw on an important debate internal to public reason liberalism, focused on the issue of the constituency that public reasons should be acceptable to.

Quong (2011) is an especially prominent contributor to this debate. He distinguishes what he calls 'internal' and 'external' approaches to it before mounting a powerful and influential attack on the external conception. His work is relevant here because the external conception has much in common with the CVV. Indeed, that conception posits that the values that can be legitimately imposed on the population (and that public reasons should therefore draw on) are those that 'actual citizens in current liberal societies could endorse' (p. 144). Hence, as stressed by the prominent externalist public reason liberal George Klosko (2000), the supporters of the external conception need processes for identifying shared values among the public, such as 'survey research, public opinion polls, and the like' (p. 9). However, creating further similarities with the CVV, Quong (p. 141) explains that the proponents of the external conception acknowledge that realistically, the most they can aim for is 'the least controversial ideas available', not universal agreement, and that some citizens hold values so offensive that they should be filtered out of 'the subset of people' whose opinions matter. On the external conception, reasonableness (which Klosko defines in a less demanding way than Rawls) comes in at this point to identify what that subset of people should be.

What are Quong's arguments against the external conception that can be repurposed against the CVV? He attacks the central idea that political decisions' legitimacy is a function of whatever views actual citizens happen to hold–an idea of legitimacy shared with the CVV that Rawls (2005) describes as 'political in the wrong way' (p. 40). For Quong (2011, p. 146), unless they meet certain requirements, it is not clear why citizens' views should be given such moral

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[25] See also Douglas (2005, p. 156).

weight. Indeed, many such views are blinded by bias, largely self-interested, straightforwardly repugnant, or otherwise affected by some serious mistake that should not be allowed to determine the legitimacy of decisions.

Quong (2011) knows that to face this difficulty, the proponents of the external conception generally restrict their focus to a subset of actual citizens—those displaying the normative features defining their preferred understanding of reasonableness. As seen, Schroeder, who develops an exceptionally widely articulated version of the CVV, makes a similar move. However, Quong (2011, p. 146) argues that this makes the appeal to actual citizens' values a 'spare wheel'; important liberal democratic institutions (or, in Schroeder's case, palatable values that enter into scientific work) are identified as legitimate only because of the external normative constraints imposed on actual citizens' views.

Quong (2011) also anticipates a possible reply denying that the appeal to actual citizens is an empty move. Specifically, it could be argued that agreement among the reasonable (or otherwise appropriately selected) citizens living in any real-world society represents a further requirement that needs to be met for any value to be legitimately imposed in that society. However, Quong (pp. 147-48) emphasises something that the supporters of both the external conception and the CVV acknowledge: that it is exceedingly rare for any value to be widely endorsed, let alone universally shared, in our societies, *even among reasonable persons*. Developing Quong's argument somewhat beyond its original form, it seems that the supporters of the CVV are stuck with a serious problem: against the background of a conception of legitimacy as acceptability to all actual citizens, settling for a mere majority of a subset of the population does not look so different from letting scientists use their sectional values (which, as seen, represents the epitome of illegitimacy from the perspective of the CVV).

Luckily, on the internal conception that forms the backdrop of both this paper's argument and the bulk of the recent public reason literature, public reasoning confers legitimacy to the decisions it produces because it is acceptable to all citizens who might decide to adopt an *idealised* perspective on political matters, regardless of how many citizens *actually* do that. This perspective is given by an openly normative understanding of Rawls's definition of political reasonableness that accordingly avoids the accusation of being political in the wrong way—an accusation that Quong's other objections rely on. Still, to complete my account of this important source of appeal of the PRV over the CVV, I must answer the question: why is that specific perspective the correct one for approaching political decisions? Put differently, why is that perspective morally required within the political forum?

This perspective revolves around reasonableness—that is, the project of making (at least the most important) political decisions in a way that we can justify to anyone else who is similarly committed to mutual justification and aware of the inevitability of pluralism. According to

Quong (2011, pp. 159, 228–30), this project is intrinsically worth pursuing (and, therefore, public reason's perspective is to be adopted) because it combines the great values of freedom, equality, and fairness. Moreover, Rawls's basic reasonable ideas of society, persons, and reasonable pluralism are meant to encapsulate in their essential political form the most central value commitments of liberal democracy. Quong (2011, pp. 139–40) talks of an 'internal' conception precisely because on this conception, public reasons only need to be acceptable to individuals who, endorsing the above ideas, effectively already embrace liberal democracy. Consequently, acceptability to a perspective defined by those basic ideas appears to provide the most fitting guide to making political decisions under a liberal democratic regime. Finally, some authors also provide deeper justifications. They argue that under conditions of pervasive comprehensive disagreement, adopting a reasonable perspective and, therefore, complying with public reason is necessary both to treat fellow citizens with equal respect for their capacity to direct themselves and to create with them the maximum possible amount of togetherness and hence civic friendship.[26]

In concluding this section, I show that the PRV can also be specified to incorporate some of the advantages of the CVV, further increasing its appeal. In general, the PRV claims that scientific advisors should base their value judgements on political and reasonable principles of justice. However, this general idea can be specified in different ways. One possible specification, which I have endorsed thus far, posits that advisors should draw on their own preferred conception of justice. A different specification says that advisors should work within the conception of justice of the elected government that they have been appointed to advise (provided, of course, that that conception is political and reasonable). This second specification has much to recommend it. Indeed, even if we hold on to the idea that legitimacy strictly understood is secured by the use of political and reasonable values, using elected politicians' values whenever possible is more democratic and therefore preferable. Consequently, I believe we should endorse the democratic specification of the PRV, with the important exception of advisory committees whose main job is to publish reports. As I now explain, those committees are not really meant to advise any single elected government, and their members are therefore allowed to rely on their preferred conception of justice.

As exemplified by SAGE and chief scientific advisors, some advisors work with the members of a single government. Hence, they can indeed be expected to identify and

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[26] Among others, Larmore (1999) develops an equal-respect argument for a broadly Rawlsian account of public reason, while Lister (2013) places civic friendship centre stage. Neufeld (2022) brings the two approaches together. Billingham and Taylor (2022) maintain that after accepting any of these justifications, we should check whether it calls for any change in the definition of reasonableness. For them, several internal conceptions, each with a slightly different understanding of reasonableness, are possible.

reconstruct *one* conception of justice (that of the government of the day) that they should use.[27] However, section 2 explained that other advisors' main function is to publish reports. Multinational advisory bodies write them for use by the governments of different countries. But even if we think about, say, the US National Academy of Sciences, it seems wrong to claim that their reports should be targeted exclusively at the US government of the day; surely part of their goal should be to inform future US governments too. In brief, at least as a rule, it seems that advisory committees oriented towards the publication of reports are not appointed to advise any single elected government. Therefore, those advisors are free to draw on their preferred political and reasonable conception of justice.[28]

However, even in the case of SAGE, chief scientific advisors, and other advisors who have ongoing exchanges with the members of a single government, the democratic specification of the PRV might seem misguided. This is because it requires that advisors become authentic value experts. Indeed, not only would advisors have to integrate their own values in their assessment of scientific knowledge, but they might also have to reconstruct and work within someone else's conception of justice. My response to this worry is that although scientists are not now qualified to conduct this task, this fact does not make a decisive difference. Virtually any approach to the which-values question that rejects the value-free ideal implies that scientific communities need to change radically. Culturally, many scientists are still far from accepting how value-laden science is. Practically, moral and political philosophy should become much more central to their training, and, among other things, scientific societies might have to create guidelines and review bodies focused specifically on the choice of value judgements. For reasons of space, I cannot investigate these practical arrangements here. However, given the radical change that needs to occur anyway, the difference between what would be required under the two alternative specifications of the PRV is not decisive.

Conclusion

This paper has brought together the discourse on public reason liberalism and discussions about the ineliminability of values from science to use each of these literatures to advance crucial debates in the other one. I argued that taking seriously the role of values within science means public reason liberals should rethink the boundaries of the political forum so it includes scientific advisors to policy makers among the actors required to follow public reason. And I

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[27] Unfortunately, the question of how they might go about this must be left for another day, although party manifestos and exchanges with politicians seem obviously relevant.
[28] If they satisfy the PRV, the values fed into an advisory report cannot really be alien to any reasonable member of any government. Indeed, any political and reasonable conception of justice is acceptable to all reasonable persons in the limited but important sense that all reasonable persons agree with the most fundamental cooperative terms it proposes–that is, the features, shared by all reasonable conceptions, that define section 4's requirement (iii).

drew on public reason liberalism to develop an original answer to the question of which values are morally allowed to enter scientific work. According to the resulting PRV, advisors should make value judgements within a conception of justice that is political, rests on reasonable foundations, and adopts reasonable priority rules. For their part, scientific researchers do not have to obey these strictures but should communicate their value judgements in a transparent way that enables backtracking by advisors. Contrasting my approach with the dominant CVV helped me identify a crucial strength of the PRV and then enabled me to specify it in a more democratic direction, further increasing its appeal.

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