Well-Ordered Science's Basic Problem

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Kitcher has proposed an ideal-theory account—well-ordered science (WOS)—of the collective good that science's research agenda should promote. Against criticism regarding WOS's action guidance, Kitcher has advised critics not to confuse substantive ideals and the ways to arrive at them, and he has defended WOS as a necessary and useful ideal for science policy. I provide a distinction between two types of ideal theories that helps clarifying WOS's elusive nature. I use this distinction to argue that the action-guidance problem that WOS faces remains even under the aims/means distinction because the WOS's failure is more basic than critics have suggested.

1. Introduction. Whether, how, and where social values enter (and have entered) into scientific practice has been widely discussed. Moving forward requires positive accounts regarding how values should influence science. Kitcher (2001, 2011) has pioneered offering a normative proposal for the determination of science's research agenda (SRA). He calls it "well-ordered science" (WOS).[1] On Kitcher's view, science is well ordered when the lines of research conducted are those that would be decided by a group of ideal deliberators under idealized circumstances.

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1. Strictly speaking, WOS includes other aspects of the practice of science (e.g., ethical restrictions for experiments), but here I focus only on the normative standard as it applies to SRA.

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Some authors have criticized WOS for being too idealized, in that it is unable to guide science policy on SRA in our current nonideal circumstances (Longino 2002; Douglas 2013; Fernández Pinto 2015). Kitcher has responded to this challenge claiming that it confuses substantive normative ideals—at which we should aim—and the ways to arrive at them (2002, 569; 2011, 125). He claims that WOS is both the kind of normative ideal needed and one that can actually provide guidance (Kitcher 2011, 125).

I argue here that WOS's problem of guidance remains even under the aims/means distinction because the failure of WOS is more basic than other critics have suggested. Kitcher understands WOS as a hypothetical procedure, the result of which constitutes the ideal SRA. I argue here that the result of this hypothetical procedure cannot be known, so WOS provides no identifiable ideal SRA that can serve as a standard of comparison for our actual SRA. Thus, Kitcher's reply that the action-guidance criticism confuses ideals and the ways to arrive at them is not true of the version of the criticism presented here. In what follows, I present WOS as described by Kitcher (sec. 2), clarify its nature as an ideal theory (sec. 3) of a specific kind (sec. 4), and argue that WOS provides no identifiable standard (sec. 5).

2. Well-Ordered Science. To propose an ideal SRA, Kitcher imagines an idealized procedure consisting in a group of deliberators, representing all the affected perspectives, being *mutually engaged* and *tutored* by scientists. The latter condition works as a "cognitive restriction," and the former, as an "affective restriction," in the sense that both are meant to avoid "myopic voters choosing in ignorance of the possibilities, and of the consequences for others, completely absorbed in their own self-directed wishes" (Kitcher 2011, 113). In this way, the resulting list of lines of research to be pursued is expected to consider (i) the scientists' expertise (regarding which research projects are plausible and what are their likely consequences for the various social needs that society deems "significant"), (ii) the deliberators' inputs (knowledge on the needs and values of all the affected parties), (iii) and the deliberators' ethical-deliberative capacity (in balancing, under conditions of mutual engagement, the extremely diverse and sometimes conflicting claims present). Having detailed this idealized procedure, Kitcher then proposes that the normative standard for SRA consists in the research projects that would be decided by such a procedure (2001, 122–23; 2011, 114).

3. Ideal Theories and WOS. Since Kitcher claims that a major obstacle in the literature on science policy has been the lack of a normative ideal, he aims to contribute by putting forth "a first shot at the *kind* of standard we *need*" (2001, 146; emphasis added). It is hard to find opposition to the claim that we need some (sort of) normative standard(s) for guiding policy. The debate is whether the kind of standard we need is one of the kind that Kitcher

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offers, which since Rawls (1999) has been called "ideal theory." This kind of standard involves the construction of an *end state* (e.g., the features of "a perfectly just society"; Rawls 1999, 8). The details of this end state involve heavy departure from actual and likely contexts of the real world (what is called "idealization").[2]

Although contemporary political philosophy draws heavily from "ideal theory," challenges to its normative justification and capacity to guide action have become widespread in the last decades. Some challenges have to do with the relevance of ideal theories in nonideal circumstances (Valentini 2009). In the case of WOS, this kind of criticism has been made by Longino (2002) and developed in more detail by Fernández Pinto (2015). Other political theorists contend that the idealizations adopted in some ideal theories tend to mislead more than guide political action (Mills 2005; Wiens 2012), while others have questioned the moral weight of the hypothetical consent usually present in ideal theories (Jaggar 1993). In the case of WOS, this last kind of criticism is echoed by Douglas (2013) and (more fully) by Keren (2015).

As defenders of Rawlsian ideal theorizing also acknowledge (Robeyns 2008; Simmons 2010), Kitcher has been eager to emphasize that more empirical knowledge is needed in order to guide specific political action. However, he has defended WOS claiming that an ideal is "something at which our practices should aim," and this is conceptually different from the identification of concrete institutional arrangements that would bring about the ideal (Kitcher 2011, 125). He acknowledges that "meaningful ideals are those for which we can envisage a path that might lead us toward them" (125). Thus, some guidance from the ideal to institutional arrangements is to be expected. But, on his view, WOS fares well in this regard because it does provide such a guidance, as he illustrates by giving an example (discussed below). Moreover, he claims—echoing Rawls's (1999) defense of ideal theory as something prior to nonideal theory—that ideal accounts are necessary because "without some understanding of where you want to go, efforts to improve on the status quo will be leaps in the dark" (Kitcher 2011, 125). Thus, Kitcher's response to the lack of action-guidance critique is to defend WOS on the grounds that (i) such an ideal is needed and that (ii) WOS is an ideal that can actually provide guidance, by giving a concrete example.

I challenge (ii) below. Regarding (i), it has been already challenged by Sen (2009), who criticizes the exclusive focus on end states ideals over "transitional accounts" when the concern is eminently practical (as it is in the case

2. Standard examples of idealizations are the attribution to human beings of degrees of rationality and moral capacities not found in most actual human beings. For characterizations of ideal theory, see Mills (2005), Robeyns (2008), Valentini (2009), and Simmons (2010).

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of science policy). Sen argues that end states ideals are neither necessary nor sufficient for determining improvements, and assessing improvements is exactly what we need to avoid "leaps in the dark." Regarding necessity, on many occasions we can certainly know whether a new scenario, say, the reduction of gender discrimination, is an improvement in justice, even if we do not know how a perfectly just society looks. Moreover, end states are not sufficient because merely knowing the end state ideal does not necessarily help us in knowing how far we are from it at each scenario or in knowing whether we are getting closer to it when the scenario changes.[3] Thus, Kitcher's claim that an ideal theory (end state) is needed for guiding science policy is unjustified.

4. Ideal Answers and Ideal Procedures. There has been some lack of clarity in the literature on the exact nature of WOS as an ideal theory (see Douglas 2013; Fernández Pinto 2015; Shaw 2018). For example, it is unclear whether the specific way WOS is expected to set standards for policy depends on the stage of the scientific practice we are considering (e.g., the agenda setting, the determination of ethical constraints on experiments). To make headway clarifying WOS, I will, first, suggest two ways in which we can read the kind of ideal theory Kitcher is proposing. WOS is explicitly framed in line with the Rawlsian project about normative principles (Kitcher 2001, 211), so parallels with Rawls's work will be useful here.

I think an important distinction can be made between normative ideals that constitute an answer to the normative question at stake ("ideal answers") and ideals that constitute a procedure for answering the normative question ("ideal procedures"). An example of the first type of ideal is Rawls's (1999) principles of justice. They constitute an answer to the question, "What does a just society look like?" Although the actual normative answer that Rawls gives is derived from his hypothetical procedure, called the "original position," his answer is independent of the procedure in the following sense. It could be derived from and justified by other arguments,[4] and, more importantly, we do not need to reimplement the procedure once we know the answer. In other words, in the case of normative ideals of the first kind, ideal answers, what we should aim at is the *result* of the hypothetical procedure, not the procedure.

3. To be clear, none of the critics of ideal theorizing argue for the implausible claim that we do not need normative standards for guiding action. The critique is rather targeting the particular way of providing standards that ideal theory (understood technically) consists in (i.e., the focus on end states, the construction of which involves highly idealized assumptions). That we do need normative ideals, such as equality, freedom, and the like, for guiding action is not in question (see Mills 2005, 168; Wiens 2012, 55).

4. Like Rawls's "informal" arguments (1999, chap. 2).

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An example of the second type of ideal, what I am calling an "ideal procedure," could be "democracy" understood as follows. One way of answering the question "Who should govern?" is by specifying an idealized procedure (e.g., free, regular, competitive, and fair elections, one vote per adult). Here, the normative answer is naturally dependent on the procedure in the sense meant above. The specific content of the answer is known only via implementing an empirical version of the idealized procedure, and the justification of that answer depends on the justification of the procedure. The ideal (that at which our practices should aim) *is* the idealized procedure. So, the answer to the normative question (in all its required detail) comes out only via mimicking the idealized procedure as close as possible. In contrast with ideal answers, the procedure is never left behind, so to speak.

In this taxonomy, Kitcher's WOS should be classified as an ideal answer. Kitcher claims that the ideal we should aim at is not the idealized procedure but consists of the answers provided by the hypothetical procedure. Thus, we achieve the ideal not by instituting empirical versions of the idealized procedure but when the institutional arrangements, whatever they are, "*invariably* lead to investigations that *coincide*" with the ones that would have been decided by the ideal deliberators (Kitcher 2001, 122). Furthermore, continues Kitcher, "there's no thought that well-ordered science must actually institute the complicated discussions I've envisaged. . . . Quite probably, setting up a vast population-wide discussion that mimicked the ideal procedure would be an extraordinarily bad idea, precisely because transactions among nonideal agents are both imperfect and costly. So the challenge is to find institutions that generate roughly the right results, even though we have no ideal deliberators to make the instantaneous decisions we hope to replicate" (123).

Thus, the ideal that WOS consists in is specified by the conclusions of ideal deliberators, that is, by the specific lines of research they would select, and not by the idealized procedure. This is analogous to the ideal of social justice that Rawls proposes, which is specified by the conclusions arrived at by his ideal deliberators in the original position (i.e., his principles of justice) and not by the original position as a procedure to imitate for choosing principles of justice in real life.

One important exegetical clarification is in place, because changes in presentation of WOS between Kitcher (2001) and Kitcher (2011) have produced confusion about what kind of ideal he is advocating. In some parts of Kitcher (2011), he seems to endorse an ideal procedure reading of his general proposal for the governing of science (e.g., 231). However, this support for a procedural reading does not occur when he discusses the SRA aspect of WOS but only when he discusses other (simpler) stages of the practice of science (e.g., deciding rules for experimenting with animals). To leave no doubts about the correct reading of WOS *for SRA*, Kitcher repeats explicitly

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the indictment that "any *actual* conversation of this type is impossible" (115). It is worth noting that other commentators have also read WOS for SRA in the same way (Longino 2002; Douglas 2013; Keren 2013). At any rate, in case there is any lingering doubt, the fact that Kitcher mentions some (detailed) conclusions at which ideal deliberators will arrive regarding SRA (see below) should suffice to convince us that he is taking WOS as an ideal answer for SRA.

5. The Problem with WOS. I now argue that Kitcher's WOS, understood as an ideal answer, cannot be action guiding because the ideal it consists in (i.e., the conclusions of his ideal deliberators) cannot be known. I argue for this negative conclusion by highlighting the challenge of arriving at the conclusions of WOS's ideal deliberators. Making a contrast between this challenge and Rawls's (1999) challenge, I hope to make plain the extreme difficulty (if not impossibility) for anybody to arrive at WOS's conclusions. However, Kitcher does claim to know what the ideal deliberators' answer will be for a particular case. If he is right that such an answer can be inferred from WOS, this would seem to rebut my criticism. Nevertheless, I will show that such an answer is both insufficient for the task at hand and, more problematically, underdetermined by WOS. Hence, it cannot be used as a counterexample to my claim that we just cannot know ideal deliberators' answers. Finally, I will assess whether we could know these answers empirically.

To visualize the challenge, recall that the task is to infer the decisions of WOS's ideal deliberators with regard to exactly which research projects (among all those available in our current circumstances) should be pursued and to what extent (Kitcher 2001, 116; 2011, 105). Let me contrast this with how Rawls (1999) sets up the task. Rawls's deliberators are to choose, under the veil of ignorance, and from a short list of candidates, their preferred principles of justice. Rawls was highly conscious of the challenges of knowing the resulting principles.[5] His way of dealing with the challenge was to radically simplify the setup: (i) the inputs of the process are simplified by the veil of ignorance (so that the deliberators do not bring any contextual information to the conversation) and by the assumptions of self-interest and of a fixed list of primary social goods that are pursued by all (so that the deliberators do not differ in preferences). Moreover, (ii) the possible outputs of the process are simplified by the fact that deliberators choose among a fixed (and short) list of candidates. This simplification of inputs and possible outputs allows Rawls

5. "If this view of the problem of justification is to succeed, we must, of course, describe in some detail the nature of this choice problem. A problem of rational decision has a definite answer only if we know the beliefs and interests of the parties, their relations with respect to one another, the alternatives between which they are to choose, the procedure whereby they make up their minds, and so on" (Rawls 1999, 16).

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to frame his normative question as a formal choice problem that may be solved by resorting to decision theory under uncertainty. However, even for this (most simplified) case, the debate regarding whether Rawls correctly inferred the principles has not ended (Gustafsson 2018).

What about WOS's ideal deliberators' task? Here we have none of the simplifications Rawls enjoys. Ideal deliberators are supposed to represent "all the alternative perspectives present in the human population, including those of people yet unborn" (Kitcher 2011, 116). Kitcher makes clear that WOS (unlike Rawls's original position) is not restricted to the perspectives of the members of a single country (116–18). The reason for including people representing "all perspectives" has to do with the fact that WOS aims to balance the interests of all those affected by SRA. This global aspect of WOS places a tremendous difficulty on anyone intending to predict the outcome of this ideal deliberation.

The challenge does not come only via the inputs, however. The possible outputs of the ideal deliberation are not a short list of research projects that need to be voted with a yes/no. Rather, it is the generation of a whole list of all the research projects to be supported and the extent they should be supported. Although the emphasis placed by Kitcher (2011) on one-off decisions (e.g., supporting the Human Genome Project or not) might make the task of predicting ideal deliberators' answers look somewhat accessible, the fact of the matter remains that WOS's deliberators' task is a much more complex one. Thus, I see no reason to think that any individual might be able to predict this detailed hypothetical deliberation.

Moreover, Kitcher himself—unlike Rawls (1999)—does not provide us with the answers of WOS's deliberators. In fact, Kitcher acknowledges that in many cases it is "hard to predict" what ideal deliberators would decide (2011, 123). Now, as I mentioned, Kitcher does claim to know one particular answer, regarding the research projects of biomedicine. And he mentions it with the explicit intention of rejecting the claim that WOS is not action guiding. However, I will show that Kitcher's answer is not only insufficient for the task but also underdetermined by WOS.

The current state of biomedical research has been criticized for its disproportionate emphasis on treatments that mostly benefit well-off patients. This has been called the "10/90 gap" (Flory and Kitcher 2004). Kitcher claims that ideal deliberators, in contrast with the prevalent 10/90 gap, would endorse "*the fair-share principle*. Waiving considerations of tractability, each disease should be investigated according to its contribution to the total suffering caused by disease" (Kitcher 2011, 122).[6]

6. The strength of Kitcher's conviction regarding the fair-share principle should not be underestimated: "Whether or not [WOS] is adopted, we maintain that a *necessary* condition for well-ordered science is that research [agenda] . . . should accord with the 'fair-share' principle" (Reiss and Kitcher 2009, 263; emphasis added).

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The idea of inferring the deliberators' choices by predicting normative principles endorsed by them (and using the principles to deduce the chosen projects when presented with the alternatives) seems more plausible than to go one by one through each of the research projects available. However, this proposal is not sufficient for the task at hand. It might be plausible to predict specific principles for priorities within each research area—like the fair-share principle. But we need more than that. We need to determine decisions about research projects both within and between research areas. Kitcher can suggest a simple principle for one area (biomedicine) because it may seem plausible to weigh all the pertinent research problems (say, solutions to diseases) of that area with a single metric of significance (in this case, "suffering caused by disease"). But simple principles are not possible when there are research problems to be compared that are of a radically different nature (e.g., education vs. health vs. cosmology). Which is the unique metric to be used?[7] Bear in mind that, under Kitcher's account, we cannot say that the unique metric is "well-being" defined by some objective standard. In constructing WOS, Kitcher has rejected this option, endorsing a subjectivist notion of well-being. Thus, although it would be possible to claim that between areas projects should be supported to the extent that they maximize well-being, it is not possible to infer the actual answers (we do not know what well-being is for each person). All said, this proposal is insufficient for giving us the complete ideal answer.

Even more damaging, successfully predicting principles seems doubtful even within areas. That ideal deliberators would arrive at (or choose according to) the fair-share principle cannot be determined only by drawing from WOS. There are a number of alternative principles that could plausibly be entertained and endorsed by WOS's ideal deliberators. First, Kitcher takes at face value that the only morally relevant metric is the total suffering caused by disease. This assumes a total utility approach. But he could as well have suggested that the research agenda should be biased in favor of diseases that affect people who are worse off. Second, although Kitcher does not say how deliberators would balance 'tractability' and 'contribution to suffering', he suggests that 'tractability' should be seriously considered (2011, 122). This is, of course, a reasonable position, one that considers the efficiency of efforts. If treatment for sickness X is less likely (or costlier) to be discovered than for sickness Y, efficiency says society should invest more research efforts in Y than in X, all other things being equal. However, there are a number of areas in which (many) societies agree on each individual having an

7. As Weinberg commented in an analogous debate, once we have decided to centralize the priority decisions of all science (as WOS does), deliberators are faced with the task of "measuring the merit of incommensurable . . . scientific fields . . . on the same scale of values" (1963, 167).

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"equal claim" to some fundamental goods, and this is so regardless of the varying costs for attaining those fundamental goods for specific populations (i.e., regardless of efficiency). And health happens to be one such area. Since suffering X versus Y can usually be considered arbitrary from a moral point of view, it seems at least plausible for ideal deliberators to disregard 'tractability' considerations (perhaps until some limit) and invest equally in both treatments (according to an equal effort principle) or even more in treatment X (according to an equal expected results principle).

The issue here is not the obvious point that there are alternative conceptions of justice that Kitcher might have considered. Rather, the issue is that there is nothing in WOS that allows Kitcher (or anybody else) to anticipate one of the alternative conceptions of justice as the one chosen and accordingly to derive principles for assigning priorities within disciplines that would match ideal deliberators' decisions. So, the biomedicine example that Kitcher offers as a proof of WOS's action guidance, I conclude, gives no plausibility to the idea that, via considering general principles within areas, we could predict the ideal deliberators' SRA.

Given the difficulty in predicting a priori ideal deliberators' answers, an alternative might be to use minipublics to predict them.[8] I do not think this is possible. To be confident in predicting the answers, we need to replicate (to some reasonable degree) the procedure. It seems clear that this is not possible in Rawls's case because many aspects of his original position are highly idealized. Thus, they are difficult to replicate empirically (e.g., the veil of ignorance, the high stakes of the decision). But the procedure depicted by Kitcher is also highly idealized and difficult to replicate. To be sure, the idealizations used by Kitcher are not the same as those used by Rawls—Kitcher does not use a veil of ignorance, and the stakes are not of the same kind. But Kitcher's idealizations are not much more (and arguably even less) replicable. Let me mention the two most salient:

i) Kitcher says that his ideal deliberators are expected to represent each and every interest (worldwide, current and future) affected by SRA. This, as argued by Goodin (2007), entails that all interests need to be represented: when the decisions to be taken are such that may affect every interest, then every interest is in fact affected. This idealization (i.e., representing all the perspectives) seems, to say the least, hard to replicate to a reasonable degree.

8. Thanks to an anonymous referee for pressing this point. This possibility, to be clear, is different from taking WOS to be an ideal procedure, where the idealized procedure is the normative standard we aim at, not an idealized method to predict the actual normative standard.

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ii) Kitcher describes his idealized deliberators as follows: "Built in to the ideal of discussion under mutual engagement are cognitive and affective constraints. . . . The ideal conversationalists are to have a wide understanding of the various lines of research, what they might accomplish, how various findings would affect others, how those others adjust their starting preferences, and the conversationalists are dedicated to promoting the wishes other participants eventually form" (2011, 113).

It is hard to see how this cognitive idealization—all parties are expected to have a wide understanding of the various lines of research—can be empirically replicated. And the affective idealization seems even more implausible to replicate—all parties are expected to dedicate themselves to promote the wishes of others. We can, of course, actually conduct minipublics trying to emulate to some degree (quite minimum, to be sure) these idealizations. But, given the idealized circumstances "built in to the ideal discussion" by Kitcher, we cannot be confident in empirically predicting the ideal deliberators' answers.

6. Conclusion. Kitcher understands WOS as a hypothetical deliberative procedure, the conclusions of which we should aim at. This makes WOS a normative standard of the kind I call an "ideal answer." I have argued here that, since those answers cannot be known, WOS provides no identifiable ideal research agenda as a benchmark against which we can assess the research agenda of real-world science. Thus, the action-guidance problem of WOS is not one of application of its normative standard but a more basic one.

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