The Rightful Place of Science:

Science, Values, and Democracy

The 2016 Descartes Lectures

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Commentary on Lecture 1

TENSIONS AMONG IDEALS

Kristina Rolin

In "Science and Values: The Pervasive Entanglement," Heather Douglas advances a research program on values and science. The research program aims to develop a set of ideals that are nested in the sense that some ideals are addressed directly to individual scientists, some others to scientific communities with the aim of providing guidance for interactions among scientists within these communities, and yet others to stakeholders with the aim of providing guidance for interactions among scientists, policymakers, and lay people. In order to promote this research program, I argue that there are tensions among some of the ideals Douglas recommends for scientists and scientific communities. Striking an appropriate balance between ideals and requirements that pull in opposite directions is crucial for the success of the research program.

In Section 1, I present an overview of the ideals and normative principles Douglas identifies in the literature on values and science. In Section 2, I introduce the ideal of cognitive diversity, which is thought to be part of the

proper functioning of scientific communities. In Section 3, I argue that there is a trade-off between the ideal of cognitive diversity and the requirement of shared standards. Further, there is a tension between the ideal of cognitive diversity and the ideal of "getting the right values into science."

1. Five Ideals

In the literature on values and science, Douglas identifies five ideals. The first three ideals are norms that individual scientists should follow in their scientific practices. The fourth and the fifth ideals are descriptions of epistemically ideal social arrangements. These descriptions involve norms that guide scientists in their interactions with other scientists or stakeholders of science. Besides norms, they involve principles for organizing scientific communities and institutions:

1. Placing priority on epistemic values
2. Role restrictions for values in science
3. Getting the right values into science
4. Ensuring proper community functioning
5. Ensuring good institutional structures for scientific practice

Douglas argues that there is no one all-encompassing ideal that can replace the value-free ideal; that is, the view that non-epistemic values have no legitimate role to play in the evaluation and justification of knowledge claims. In her view, we need a complex set of ideals that includes not only the first three items on the list, but also norms and organizational principles from the fourth and fifth items on the list.

The first ideal states that non-epistemic values should not hinder the attainment of truth within the realm of morally acceptable science. While Douglas does not object to

this ideal, she thinks that it is not very informative as long as it does not specify what morally acceptable science is. The second ideal states that moral and social values are allowed to play an indirect role in deciding when evidence is strong enough, but they are not allowed to play a direct role. While Douglas emphasizes the importance of this ideal, she reminds us that it has a rather narrow domain of application. The ideal is meant to give guidance for evidential reasoning, and it has little to say about other moments in scientific inquiry. Therefore, it is better thought of as a minimum requirement for good scientific practice rather than as a full-service theory on values and science. The third ideal states that when moral and social values play legitimate roles in science, scientists need to ensure that they are the right values. According to Douglas, one virtue in this ideal is that it "successfully addresses concerns about research agenda choices and methodological choices, choices about which the role restriction norm has little to say."[1] However, the third ideal is inaccurate and incomplete insofar as it does not tell us how people are to decide what the right values are, or how scientists are to be informed about the right values.

Whereas the first three ideals state norms that individual scientists are accountable to conforming to in their scientific practice, the fourth and the fifth ideals are concerned with epistemically well-designed scientific communities and institutions. The fourth ideal (ensuring proper community functioning) involves not just a single norm, but a set of norms that scientific communities need to comply with in order to be successful in the pursuit of their epistemic goals. An example of such a set is Helen Longino's social value management ideal as found in her book *The Fate of Knowledge*. According to Longino, scientific communities should conform to the four norms of publicly recognized venues, uptake of criticism, shared standards, and tempered equality of intellectual authority.[2] Longino claims

also that "A diversity of perspectives is necessary for vigorous and epistemically effective critical discourse."[3] Another example of a set of norms intended to be applicable to scientific communities is Miriam Solomon's social empiricism. Solomon recommends that science policymakers take steps to cultivate cognitive diversity and dissent in scientific communities.[4] By cognitive diversity, she means a diversity of theoretical approaches that have some empirical successes.[5]

The fifth ideal (ensuring good institutional structures for scientific practice) involves, among other things, a set of norms that govern interactions between scientific communities and the broader society. Douglas observes, I think rightly, that there is plenty of work to do to develop this set of norms and organizational principles. The work involves answering such questions as: What are the responsibilities of scientists when they function as experts in society? What are the responsibilities of policymakers and lay people when they rely on experts or use scientific knowledge in their decision-making? What kind of institutional structures are ideal for facilitating interactions between scientists, policymakers, and lay people in different arenas of public life?

Douglas argues that we need a set of ideals crafted from all of the five items on the list insofar as the ideals form a consistent whole. In order to contribute to this research program, I argue that there are tensions among some of the ideals. Insofar as an epistemically ideal scientific community is thought to be cognitively diverse,[6] the ideal is in tension not only with the requirement of shared standards,[7] but also with Douglas's third ideal demanding that values in science are the "right values." To better understand the tensions, I explain first why cognitive diversity is seen as an epistemic ideal.

2. What Is the Ideal of Cognitive Diversity?

In order to understand why cognitive diversity is of epistemic interest, it is necessary to introduce a distinction between cognitive and social diversity. A scientific community is cognitively diverse when its members have, for example, different research styles and skills, different perspectives on the subject matter of inquiry, or access to different bodies of empirical evidence. A scientific community is socially diverse when its members have different non-epistemic values, such as moral and political values, or different social locations, such as gender, ethnic identity, nationality, and race. It is a matter of empirical inquiry to understand how social diversity might be connected to epistemically beneficial cognitive diversity.

A number of philosophers argue that cognitive diversity is epistemically beneficial because it maintains a distribution of research efforts in scientific communities, gives rise to critical perspectives, and generates new research problems. Cognitive diversity is not claimed to be an epistemic virtue intrinsically. The claim is rather that, under some circumstances, it promotes the epistemic goals of science when these goals are understood to include significant truth[8] or empirical success.[9] In this section, I present a review of arguments defending the epistemic benefits of cognitive diversity.

2.1 Distribution of Research Efforts

In Philip Kitcher's article "The Division of Cognitive Labor," cognitive diversity is understood as a *diversity of theories or methods* addressing a common problem. Kitcher argues that cognitive diversity is epistemically beneficial in certain stages of inquiry, when it is not yet possible to tell which theory (or theories) will be true or most successful empirically, or which method (or methods) will lead to a breakthrough. When competing theories have different ep-

istemic virtues or when different methods have complementary advantages, it is more reasonable to distribute resources among the theories or the methods than to allocate all available resources to one theory or method.

Kitcher argues that a distribution of research efforts can be epistemically desirable even in an instance where it would be rational for all community members to agree that one theory is superior to its rivals. Kitcher suggests that at least some community members should pursue a theory that is widely known to be inferior to the most promising theory. While the pursuit of such a theory is not rational from an individual point of view (given a traditional conception of rationality), it can be rational from a community point of view. It is in the interest of the community to maintain a competition among rival research programs.

Kitcher also argues that even in an instance where community members are united in their understanding of theoretical virtues, a distribution of research efforts may be an outcome of scientists' personal interest in credit. Instead of evaluating merely whether a theory is acceptable in light of available evidence and background information, a rational individual makes decisions strategically by anticipating other community members' behavior. If an inferior theory turns out to be true, great credit will be due to those scientists who have risked their careers for it.

Kitcher's arguments have been developed further by many philosophers. For example, in "Scientific Rationality and Human Reasoning," Solomon argues that the geological revolution between 1920s and 1960s is an example of scientific change where cognitive diversity played an epistemically positive role by creating a distribution of research efforts. Unlike Kitcher, Solomon does not believe that a distribution of research efforts will take place by "an invisible hand of reason."[10] She thinks that science policymakers and scientists who are in a position to make funding decisions

are responsible for ensuring that scientific disagreements are not closed prematurely.[11]

2.2 Social Value Management

In Longino's contextual empiricism[12]—or critical contextual empiricism[13]—cognitive diversity is understood as a *diversity of perspectives* on the subject matter of inquiry. While cognitive diversity does not always go hand in hand with social diversity, Longino suggests that in many cases, a diversity of perspectives is an outcome of a diversity of social values in scientific communities. For example, when feminist scientists entered the field of human evolution, they introduced a novel perspective on the anatomical and behavioral development of human species. In the controversy over human evolution in the 1970s, they challenged the "man the hunter" narrative by developing the "woman the gatherer" narrative to offer an alternative interpretation of empirical evidence. Neither perspective was apparent in light of empirical evidence. Both perspectives were value-laden in the sense that they assumed the centrality of one sex's behavior in the evolution of the entire species.[14]

In contextual empiricism, cognitive diversity is thought to be epistemically beneficial not only because it generates a distribution of research efforts, but also because it generates critical exchanges in the community. Criticism can improve scientific knowledge in many ways. It can help scientists identify and correct false beliefs or biased accounts of the subject matter of inquiry. And even when criticism does not give scientists a reason to reject a view, it can be epistemically valuable by forcing them to provide better arguments for their view or to communicate their view more clearly and effectively. Criticism can help scientists avoid dogmatism.

Longino argues that a diversity of social values is epistemically beneficial because scientists are more likely to identify values that have influenced scientific research

when the values in question are different from their own. As she explains, background assumptions may be value-laden in the sense that they lead scientists to highlight certain morally and socially significant aspects of a phenomenon over others, or they have morally and socially significant practical consequences, such as promoting one conception of human agency over another.[15]

In order to keep the influence of social values at bay, scientific communities need to be constrained by the four norms of publicly recognized venues, uptake of criticism, shared standards, and tempered equality of intellectual authority. This is needed to ensure objectivity.[16]

2.3 Diversity of Social Experiences

In feminist standpoint theory[17]—or standpoint empiricism[18]—cognitive diversity is understood as a *diversity of social experiences* that have a bearing on scientific research. When cognitive diversity is understood in this way, it is closely related to a diversity of social locations. Thus, standpoint empiricism has affinities with social epistemologies that emphasize the epistemic benefits of democracy.[19] In both approaches, a diversity of social locations is seen as an epistemic resource because information that is relevant for understanding complex social phenomena is distributed across the society depending, among other things, on individuals' social class, occupation, education, gender, race, and ethnic identity.

Like many other philosophers, standpoint empiricists believe that cognitive diversity is epistemically valuable when it leads to a distribution of research efforts, critical perspectives, or novel lines of inquiry. In addition, standpoint empiricists argue that a diversity of social experiences brings yet another benefit to scientific communities: marginal or unprivileged social locations are potentially a source of insight on the way relations of power work in the society as well as in the production of scientific knowledge.

Standpoint empiricists argue that a marginal or unprivileged social location in and by itself may not have epistemically interesting consequences unless it is developed into a standpoint. In their view, a standpoint is a collective rather than an individual achievement.[20] Insofar as there is an epistemic advantage associated with marginal or unprivileged social locations, a scientific/intellectual movement is needed to realize the advantage. Scientific/intellectual movements are epistemically productive when they enable scientists to generate evidence under conditions where relations of power tend to suppress or distort evidence, and they provide scientists with an epistemic community where they can receive fruitful criticism for research that may be ignored in the larger scientific community.[21]

In sum, epistemically beneficial cognitive diversity can come in many forms—a diversity of theories, methods, perspectives, and social experiences—and have many causes. Cognitive diversity is thought to be epistemically beneficial for at least four reasons. One reason is that it generates a distribution of research efforts. As no one is in a position to know in advance which lines of inquiry will be fruitful, scientific communities are better off by distributing their resources among several different and sometimes competing theories and methods. Another reason to value cognitive diversity is that it is a source of critical perspectives, which can improve scientific knowledge in many ways. Critical perspectives are needed especially in those cases where scientific research is value-laden. Yet another reason to value cognitive diversity is that it is a source of scientific creativity that can lead scientists to pursue new lines of inquiry, search for new evidence, propose new hypotheses and theories, and develop new methods of inquiry. Finally, cognitive diversity is especially epistemically fruitful in research projects that aim to produce evidence despite obstacles raised by association with power and social inequalities.

3. Tensions Among Ideals

Douglas, like many other philosophers, thinks that normative approaches to values and science should be concerned with proper functioning of scientific communities. While there is some disagreement over what proper functioning involves, most philosophers emphasize the importance of publicly recognized standards. Shared standards are needed to ensure that theories, hypotheses, methods, and observational practices can be criticized in a meaningful way.[22] Such standards are expected in order to ascertain what counts as an appropriate criticism that deserves uptake and what counts as a satisfying response to the criticism. What exactly the standards are depends, of course, on the specialty and the discipline we are concerned with. The standards are not beyond criticism, but at least some of them need to be widely accepted so that scientists can come to agree on appropriate criticism and response to criticism.

I argue that there is a trade-off between the ideal of cognitive diversity and the requirement of shared standards. While the ideal of cognitive diversity is meant to ensure that scientific communities benefit from a wide range of critical perspectives, the requirement of shared standards sets limits to the amount of cognitive diversity scientific communities can accommodate. The reason for this is that the requirement of shared standards excludes those critics who fail to follow the standards of the scientific community, or at least a sufficiently large number of the standards. To what extent the shared-standards criterion limits the scope of appropriate criticism depends on how the criterion is understood.[23] The challenge is to understand how many and which standards need to be shared for a scientific community to be able to function as a forum for meaningful criticism and response to criticism. Meeting this challenge involves striking a balance between cognitive diversity and shared standards.

Besides this trade-off, there is a tension between the ideal of cognitive diversity and the ideal of "getting the right values into science." The latter ideal states that when moral and social values play legitimate roles in science, we need to ensure that they are the right values. Insofar as epistemically beneficial cognitive diversity is generated by social diversity, it seems that almost any social diversity should be welcomed into scientific communities. This has led some philosophers to worry, I think rightly so, that the ideal of cognitive diversity will invite morally and politically problematic views into science, such as sexist and racist beliefs. Clearly, this was not the intention behind Kitcher's, Solomon's, and Longino's arguments. Nevertheless, the concern is that despite good intentions, the ideal of cognitive diversity may be abused by sexists and racists to demand resources to scientific research that is complicit in sexist and racist ideologies.[24]

I argue that the tension between the ideal of cognitive diversity and the ideal of "getting the right values into science" can be reduced by giving more specific content to the latter ideal. If the latter ideal includes the requirement for tempered equality of intellectual authority,[25] then it is in conflict with sexist and racist ideologies, which violate the view that all human beings deserve to be heard and treated respectfully. The requirement of tempered equality does not protect those speech acts that undermine the requirement itself.

In response to the concern that the ideal of cognitive diversity invites problematic values into science, Daniel Hicks introduces the good faith principle. According to this principle, it is not sufficient to require that scientists play by the rules of scientific communities; they need to do so in good faith.[26] Good faith participation in scientific communities requires that scientists do not reject the moral-political principles that underwrite and motivate the norms of epistemic communities. Such principles, he argues, include

formal egalitarianism and liberal pluralism.[27] While the former states that all community members enjoy the same formal standing, the latter insists that there is room for reasonable disagreement.[28]

4. Conclusion

I have argued that any attempt to arrive at a synthesis of the five ideals will have to consider trade-offs and tensions between ideals and requirements that seem to be in conflict. More specifically, I have argued that there are two tensions among the ideals: one between the ideals of cognitive diversity and the requirement of shared standards, and the other between the ideals of cognitive diversity and "getting the right values into science." The research program envisioned by Douglas needs to strike a balance between these ideals.

Notes

[1] Heather Douglas, this volume, 26.

[2] Helen Longino, *The Fate of Knowledge* (Princeton, NJ: Princeton University Press, 2001), 129–134.

[3] Ibid., 131.

[4] Miriam Solomon, *Social Empiricism* (Cambridge, MA: MIT Press, 2001), 150.

[5] Ibid., 117.

[6] Helen Longino, *The Fate of Knowledge* (Princeton, NJ: Princeton University Press, 2001); Miriam Solomon, *Social Empiricism* (Cambridge, MA: MIT Press, 2001).

[7] Helen Longino, *The Fate of Knowledge* (Princeton, NJ: Princeton University Press, 2001), 130–131.

[8] Philip Kitcher, *The Advancement of Science: Science Without Legend, Objectivity Without Illusions* (New York, NY: Oxford University Press, 1993).

[9] Miriam Solomon, *Social Empiricism* (Cambridge, MA: MIT Press, 2001).

[10] Ibid., 95.

[11] Ibid., 150.

[12] As exemplified in Helen Longino, *Science as Social Knowledge, Values and Objectivity in Scientific Inquiry* (Princeton, NJ: Princeton University Press, 1990).

[13] As exemplified in Helen Longino, *The Fate of Knowledge* (Princeton, NJ: Princeton University Press, 2001).

[14] Helen Longino, *Science as Social Knowledge, Values and Objectivity in Scientific Inquiry* (Princeton, NJ: Princeton University Press, 1990), 106–108.

[15] Ibid., 216–218.

[16] Helen Longino, *The Fate of Knowledge* (Princeton, NJ: Princeton University Press, 2001).

[17] For example, see Sandra Harding, *Objectivity and Diversity: Another Logic of Scientific Research* (Chicago, IL: The University of Chicago Press, 2015).

[18] For example, see Kristin Intemann, "25 Years of Feminist Empiricism and Standpoint Theory: Where Are We Now?" *Hypatia* 25, no. 4 (2010): 778–796; Alison Wylie, "Why Standpoint Matters," in *Science and Other Cultures: Issues in Philosophies of Science and Technology*, Robert Figueroa and Sandra Harding, eds. (New York, NY: Routledge, 2003), 26.

[19] See Elizabeth Anderson, "The Epistemology of Democracy," *Episteme* 3, no. 1–2 (2006): 8–22.

[20] Sharon Crasnow, "Feminist Standpoint Theory," in *Philosophy of Social Science: A New Introduction*, Nancy Cartwright and Eleonora Montuschi, eds. (New York, NY: Oxford University Press, 2014), 145.

[21] Kristina Rolin, "Values, Standpoints, and Scientific/Intellectual Movements," *Studies in History and Philosophy of Science* 56 (2016): 11–19.

[22] Helen Longino, *The Fate of Knowledge* (Princeton, NJ: Princeton University Press, 2001), 130.

[23] Kristen Intemann and Inmaculada de Melo-Martín, "Are There Limits to Scientists' Obligations to Seek and Engage Dissenters?" *Synthese* 191 (2014): 2751–2765.

[24] Daniel Hicks, "Is Longino's Conception of Objectivity Feminist?" *Hypatia* 26, no. 2 (2011): 333–351.

[25] Helen Longino, *The Fate of Knowledge* (Princeton, NJ: Princeton University Press, 2001), 131.

[26] Daniel Hicks, "Is Longino's Conception of Objectivity Feminist?" *Hypatia* 26, no. 2 (2011): 333–351.

[27] Ibid., 342.

[28] Ibid.