

Collective Wisdom

Old and New

Hélène Landemore

The idea of collective wisdom presented in this volume is both old and new. It is old because Aristotle is generally credited with having first taken seriously the idea that "many heads are better than one." He himself was in fact rehearsing an argument that the Sophists were using in defense of democracy. In a much-quoted passage in the *Politics*, Aristotle thus remarks that

the many, who are not as individuals excellent men, nevertheless can, when they have come together, be better than the few best people, not individually but collectively, just as feasts to which many contribute are better than feasts provided at one person's expense. (Politics III, 11, 1281a41–1281b2 (1998): 83, my emphasis)

Jeremy Waldron (1995) has felicitously labeled this argument "the doctrine from the wisdom of the multitude." Most commentators agree that the mechanism accounting for the superiority of a group over any of its members is, in Aristotle's view, the pooling of information and arguments that occur in deliberation.

The idea of collective wisdom is new, on the other hand, to the extent that it has resurfaced in the past eight to ten years in a substantially different guise in the literature on the "wisdom of crowds" sparked in part by, or concomitant with, the success of James Surowiecki's *New York Times* best seller by the same title. Some other landmarks are Howard Rheingold's (2003) *Smart Mobs: The Next Social Revolution*, Don Tapscott and Anthony D. Williams's (2006) *Wikinomics: How Mass Collaboration Changes Everything*, Cass Sunstein's

This volume is based on the contributions to an international conference that took place at the Collège de France in Paris, May 24–25, 2008. Jon Elster and I would like to thank Karen Kroxson, Stéphanie Novak, Pierre Rosanvallon, and Yves Sintomer for their crucial role as discussants on this occasion. Videos of the presentations are available at http://www.cerimes.education. fr/sagesse-collective-principes-mecanismes-catalogue-college-france-philosophie-fiches-a223154s 1000010l7t24_.html. Special thanks to Austin Baik for his work on the index and invaluable help throughout the editing process.

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¹ See Surowiecki (2004).



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(2006) Infotopia: How Many Minds Produce Knowledge, and a more specific management literature, such as Jeff Howe's (2008) Crowd-Sourcing: How the Power of the Crowd Is Driving the Future of Business, as well as collectively authored books such as Charles Leadbeater's (2008) We-think: The Power of Mass Creativity and Barry Libert and John Spector's (2008) We Are Smarter Than Me: How to Unleash the Power of Crowds in Your Business.²

The novelty here, compared with what Aristotle was describing, is at least threefold. The first novelty lies in the sheer scope of collective wisdom, involving millions of individuals rather than the few thousand at best that Aristotle had in mind (assuming, plausibly, that he was thinking of Athenian assemblies).

The second novelty is that many of these phenomena – for example, the predictive accuracy of information markets – do not depend on or involve any kind of deliberation or direct and conscious communication among the participants. In Surowiecki's book, the opening and paradigmatic example of the wisdom of the crowds is Francis Galton's statistical experiment at a country fair, in which many individuals wrote down their best guess about the weight of an ox once slaughtered and dressed, and the median guess of the eight hundred participants turned out to fall within one pound of the right answer. Another example is that of the *Scorpion*, a lost submarine found only after all the individual guesses of a diverse group of mathematicians, submarine specialists, and salvage men had been averaged out, without any prior deliberation among them. When deliberation is at play – for example, in the case of Wikipedia – it takes forms that depart from the classical exchange of arguments that Aristotle had in mind, being more fragmented but also more cooperative and creative in many ways.

As a result, it is dubious that the mechanisms at play in the wisdom of crowds have much to do with the type of deliberation as exchange of arguments in a public forum that Aristotle was most likely thinking of. Indeed, the literature on the wisdom of crowds generally focuses on information markets, polling, voting, or the logic of search engines like Google that do not involve any form of communication among the participants and that do not even require that they either know one another or are in each other's physical presence. What seems more likely to account for the emergence of collective wisdom in such cases is not so much classical deliberation as other forms of judgment and preference aggregation procedure.

Collective books on collective intelligence are particularly interesting from a formal and procedural point of view (although they have not always been particularly successful from the substantive point of view). We Are Smarter Than Me, for example, involved the collaboration of thousands of business professionals and scholars, who all get equal credit inside the book's cover, as does an uncredited "crowd" of more than a million students. All participants contributed Wikipedia-style, co-writing and sharing insights on a wiki page. In France, Marc Foglia's (2008) collaborative volume on Wikipedia consists of multiple entries by the main author, which are supplemented by longer articles by other contributors. Our own edited volume is a much more traditional and conservative attempt at tapping the collective wisdom of many authors by simply juxtaposing their contributions to a common topic.



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Notice that further differentiation among nondeliberative judgment aggregation procedures is needed. In voting, for example, participants not only do not communicate with others as they vote, but also are not supposed to be influenced by the concomitantly emerging collective wisdom of the rest of the voters, which is why, say, Canadian law forbids election returns from the East Coast to be publicized before the polls close on the West Coast. This is to be contrasted with the logic of Google or Amazon, where collective wisdom emerges as a result of stigmergy - a phenomenon of self-organization first observed in societies of insects that refers to a situation in which entities leave meaningful trails in the environment that have an impact on subsequent entities passing that way. Google illustrates this phenomenon in that it involves iterative feedback through which the existing popularity of a site increases its chances of being seen and linked to, further magnifying its apparent popularity on Google. In the case of Amazon, the program has a function "People who bought this book also bought these other books," a statement that reinforces itself over time as customers take the hint and buy the other books that are popular among persons of their type. The collective wisdom emerging from the Google and Amazon programs lies in the fact that they translate individual clicks and purchases into an informational trace for subsequent visitors, in a way that is comparable to the way ants use the chemical clues left on the soil by previous ant traffic to make decisions about where to go next.³

Of course, one might want to make the case that all these apparently non-deliberative procedures are in fact parts or the expression of a more general process of decentralized and distributed deliberation, one in which ideas circulate among masses of people in ways similar to what deliberation does among individuals, although the process does not take place among all the participants at once but mere clusters of them and does not involve all there is to deliberate but only subtopics or elements. Supplemented by large-scale ways to aggregate the views of the many, this initially decentralized process of deliberation may amount to the kind of collective wisdom that Aristotle had in mind – only disindividualized (distributed over both smaller and larger entities than individuals) and writ larger.

A third novelty of the contemporary idea of collective wisdom lies in the importance of the notions of network and connectedness, which captures the fact that information is transmitted and distributed across diversely connected individuals rather than centralized in one specific public sphere. This volume touches only tangentially on that aspect of collective wisdom, but I should mention the existence of an exploding body of scientific work on the properties of networks. The boom in this realm in the past ten years has included work done by physicists, computer scientists, and sociologists (for a survey see the introductory chapters of Newman, Baribasi, and Watts 2006). Furthermore, little if anything is mentioned in the volume about the related but distinct question of

³ I thank Tom Atlee for suggesting these distinctions and comparisons.

⁴ I thank Robert Laubacher for bringing this literature to my attention.



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social networks (such as MySpace, Facebook, Google+, and Twitter) and their implications in terms of collective wisdom. The point of such networks may not explicitly be to produce any kind of collective answer to a given individual or collective problem, but it does not seem far-fetched to suppose that they can contribute to the formation of such answers in indirect ways. I would hypothesize that these networking interactions and the information they convey can contribute to reducing pluralistic ignorance⁵ and dispelling some common yet erroneous beliefs among communities that extend beyond the traditional circle of friends living in the same neighborhood or the same city. It might be, of course, that under some circumstances, these social interfaces actually amplify polarization and biases, but it is by no means necessary. On the contrary, the multiplication of "weak ties" (Granovetter 1973) to very different people that these networks favor makes it unlikely. For example, Facebook's loose definition of who counts as a "friend" actually ensures that you include in your network not just close people who think exactly like you, but a lot of vague acquaintances whose views may be extremely diverse. It is through these weak ties that individuals can gain access to information from distant parts of the social system rather than be confined to the news and views of their close friends. One could thus argue that social networks prepare the ground for higher-quality collective decisions. Unfortunately, the owl of academia takes its flight too late in these times of lightning-speed technological change, and we perhaps spared ourselves the discomfort of utter outdatedness by not taking on that extra dimension of the topic, although the question of social networks and "networked publics" (Varnelis 2008) is definitely in need of more research.7

All in all, I would argue that the new "collective wisdom" is not just the old one writ large. The Internet-based technological revolution that has taken place over the past twenty years is changing the reality of human affairs and interactions. The explosion of the literature on collective intelligence has already affected the way business and politics are conducted, spreading the view that, in an increasingly complex and connected world, knowledge and smart solutions are more likely to emerge from the bottom up, among groups of regular

- ⁵ "Pluralistic ignorance" refers to a situation in which a majority of group members privately reject a norm but assume incorrectly that most others accept it, which provides support for a norm that may in fact be disliked by a majority of people. For example, most people, prior to their experience on Facebook, probably thought that everyone else morally objected to the exhibition of one's private life, through pictures, among other things, as a form of despicable narcissism
- ⁶ Such as, trivially, the belief that you cannot be both a serious employee and a goofy person or, more significantly, the belief that other citizens subscribe to repressive government policies when in fact they share a common rejection and fear of the existing authorities. For an example of the usefulness of Facebook in reducing pluralistic ignorance in potentially revolutionary ways, see its usage in the Arab world: http://www.nytimes.com/2009/01/25/magazine/25bloggers-t.html?_r=5&pagewanted=1&emc=eta1.
- For a recent, exciting take on social networks, see papers by danah boyd, e.g., her doctoral thesis, "Taken Out of Context" (2008), http://www.danah.org/papers/TakenOutOfContext.pdf.



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people, than to be produced at the top by a few experts.⁸ It is now time for the theory to catch up with the practice.

The goal of this edited volume is to go beyond the accumulation of anecdotes and vague intuitions about collective wisdom and to offer the first attempt at a systematic and scholarly inquiry into the nature of the phenomenon. The focus is more specifically on the "principles" and "mechanisms" of collective wisdom. Very roughly speaking, one can say that the principles are at least two: individual intelligence (or, depending on the contributors, ability, sophistication, or epistemic competence) and cognitive diversity. The mechanisms involved are many (also depending on what the contributors mean by "mechanisms"), but they roughly fall into either of two categories: deliberative practices, on the one hand, and aggregation procedures that do not require actual communication or an exchange of views among the participants, such as information markets and voting, on the other. The volume also includes contributions concerned with applications and institutional design.

Let me say a word here about the importance of "cognitive diversity" as a principle of collective wisdom. To some, the idea that a multiplicity of points of view, in which cognitive diversity seems immediately to translate, matters to the quality of the outcome will seem fairly intuitive, and in fact it has been established at least since John Stuart Mill's celebration of freedom of thought in On Liberty. We are better off in our collective pursuit of truth, Mill argued, if all of us are free to speak our minds, so that (1) we do not risk silencing true opinions by mistaking them for false ones; (2) the bits of truth often contained in wrong opinions can rise to the surface and supplement our received but partial truths; (3) complete and established truths themselves do not turn into dead dogma for lack of having to be proved over and over again against falsehoods; and (4) for lack of being constantly vivified in the mind and soul of individuals by the need to refute critics (On Liberty, ch. 2, p. 53). While arguably qualifying as an epistemic liberal, that is, a liberal who thinks that a regime of individual freedoms is conducive to truth, Mill does not elucidate sufficiently the logic that produces truth out of the coexistence and clash of conflicting points of view. The same could be said of James Surowiecki's (2004) book, which certainly lists diversity as a key factor but lumps together all sorts of diversity and merely registers some factual evidence in favor of these forms of diversity. Similarly, Cass Sunstein (2002, 2006) suggests that social diversity is conducive to a more diverse pool of arguments, which is useful to avoid polarization effects, but ends up registering a mere correlation, not a causal effect. I would argue that Lu Hong and Scott Page's work, on the other hand, goes some notable way toward elucidating the puzzle of why a diversity of viewpoints matters for the quality of collective outcomes. By looking closely at the microfoundations of collective intelligence, their work emphasizes that only a certain type of diversity is good: what they call "cognitive diversity," or the existence in a group

⁸ See, e.g., the work conducted by Tom Atlee and his peers at the Co-Intelligence Institute. http://www.co-intelligence.org/index.html.



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of different interpretive and predictive models used by individuals to navigate the world. This fundamental diversity in the way people treat information and produce arguments will often translate into a variety of viewpoints but is not reducible to them, no more than a variety of processes can be reduced to the variety of outcomes they may result in. Hong and Page also crucially distinguish among different contexts for collective intelligence. They show that, in predictive settings, cognitive diversity matters as much as individual ability. For problem solving, however, cognitive diversity matters *more* than individual ability. In other words, in some contexts, ensuring enough cognitive diversity may offset the lack of brilliant minds in a group. These rather counterintuitive conclusions are not just new and mind-boggling. They open new avenues for research and, if true, entail far-reaching social, economic, legal, and political implications.

In the remainder of this introduction, I will explain the choice of "collective wisdom" as the title of the volume and then give a brief overview of each contribution and point out ways in which the essays respond to each other or leave room for further research.

COLLECTIVE WISDOM

As the editors of this collection of essays, Jon Elster and I have used the term "collective wisdom" rather than "collective intelligence" or "wisdom of the crowds" or "wisdom of the multitude." Although some of the authors in this volume use these expressions interchangeably, we do think that there is a distinction between the terms "wisdom" and "intelligence," as there is a distinction between a group and a crowd or between a collective and a mere multitude.

We first privileged "wisdom" over "intelligence" because it seemed to us that the notion of wisdom – however vague and antiquated in some ways – was a more encompassing notion than the apparently more technical concept of intelligence, offering as a result more common ground for people coming from different disciplines. To an extent, we also wanted to avoid suggesting that the volume is about information technologies or computer sciences, which are the disciplines often associated with the concept of intelligence (as in "artificial intelligence"). While the questions raised in those fields should certainly be on the horizon of any study of collective wisdom, we for the most part steered clear of that more technical path. ¹⁰

⁹ In other words, when the issue is to solve a collective problem of some complexity, it matters more for the emergence of a good collective answer that we add diversely thinking individuals to the group than yet another member of "the best and the brightest."

¹⁰ See instead the work of researchers at the MIT Center for Collective Intelligence, who specifically focus on the interface between human intelligence and the computer: http://cci.mit.edu/.



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This is not to say, far from it, that we reject the concept of intelligence, at least understood broadly as the ability to comprehend one's surroundings and to figure out what to do, as opposed to mere book learning or test-taking smarts (i.e., intelligence as mere IQ). Some of the essays in this volume thus resort to a concept of "collective intelligence" as such a complex notion of intelligence premised of groups as opposed to individuals.

Another advantage of the notion of "wisdom" over that of "intelligence" is that whereas intelligence may seem to refer to the here and now, wisdom evokes a larger temporal horizon. The idea of wisdom suggests the intelligence of a collective extending not just through space (including many people) but through time as well (including many generations), thus making room for both experience and memory – as they are transmitted, for example, in proverbs and sayings or preserved by institutions such as constitutions or museums – and perhaps making room also for the ability to project the impact of one's actions into the future. Few of the essays develop the temporal or diachronic dimension of collective wisdom, but it is clearly an element of the problem. Another question oriented toward the future would be: How do we maximize our chances that apparently intelligent decisions taken today will turn out to be wise for the seventh generation after us?

The concept of wisdom was also chosen over that of rationality. Never a serious contender in our view, the concept of rationality has a major pull in disciplines like economics, political sciences, and the law. Yet it seems to us that rationality is not the most adequate concept to describe phenomena such as the predictive accuracy of information markets, the descriptive correctness of Wikipedia entries, or the rightness of decisions and choices made by deliberating groups or majorities. The notion of wisdom implies a commitment to the view that there is something substantially right or correct, perhaps even "true," about the decisions reached. In effect, it implies some judgment about the morality of the content of those decisions. Rationality, by contrast, is more often used in contexts where coherence and formal correctness, rather than substantive (moral) truth or rightness, are all that matters. The concept of rationality also gives too central a role to the faculty of reason, whereas wisdom makes room for habit, tradition, perhaps even certain forms of emotions or, as Hume would put it, "calm passions."

As to the adjective "collective" in "collective wisdom," the term needs a justification of its own, especially in relation to the rival notions of "wisdom of the crowds" or "distributed intelligence." First, it should be noted that a collective can refer to the sum of its parts or something else altogether. Our title leaves both interpretations open. Many of the contributors, however, defend collective wisdom as more than a direct function of individual wisdom and in effect something of an emergent or supervenient phenomenon, of a different nature or quality than what may or may not be observed at the level of individuals. As Lu Hong and Scott Page argue, for example, an essential ingredient of collective wisdom is the cognitive diversity of the group,

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a property that, by definition and unlike individual ability, cannot be found in individuals.¹¹

Second, "collective" wisdom can also be understood as a distributed phenomenon. In computer sciences and cognitive sciences, distributed intelligence or distributed cognition refers to a decentralized way of processing information and solving problems. More specifically, in cognitive sciences, distributed intelligence refers to cognitive processes that are stretched across individuals and their different components (mind, body, and activity) as well as culturally organized settings, including groups and institutions (Lave 1981: 1).¹² Distributed cognition thus refers to an emergent phenomenon that cannot be traced simply to individual minds, but rather to the interaction between those minds and between them and their constructed environment (which plays the role of extending their cognitive capacities).

Conceptualizing collective wisdom as a potentially distributed phenomenon is important in two respects. First, it suggests that collective wisdom is an emergent phenomenon rather than the amplification of individual wisdom.

As mentioned earlier, collective wisdom can be understood as an amplification of individuals' cognitive abilities, performing for individuals' wisdom what a megaphone, say, does for an individual's voice, namely intensifying it. This intensity is, perhaps, what a certain type of deliberation is meant to achieve, publicizing as an end result of debates among individuals the knowledge of a few members of the group and enlightening the rest about the nature of a problem and its potential solutions. In this case, collective wisdom is just the wisdom of an individual appropriated by the group. Or collective wisdom can be understood as something different from individual wisdom publicized and writ large and, indeed, as an emergent and systemic property that can be distributed across the members of a group and their institutional environment, their culture, their historical heritage, as well as their communication technologies, their media, and their information systems.

Viewing collective wisdom as a distributed phenomenon also precludes the view of collective wisdom as necessarily involving a central authority. Whereas a particular mechanism – whether an information market yielding a prediction, an algorithm, or a decision procedure – is required to express a particular

- Notice that while emphasizing that the diversity of a group cannot be found in individuals, I am not ruling out the possibility that individuals themselves can be wise to the extent that they have themselves a form of internal cognitive diversity, being, for example, able to view things from multiple perspectives and even to hold as equally valid seemingly contradictory propositions. One might further hypothesize that individuals are "wise" to the extent that they have internalized the collective wisdom of the group they belong to, as opposed to being merely "intelligent" in a narrowly individualistic sense (I owe this idea to Hugo Mercier).
- A famous study by the cognitive anthropologist Edwin Hutchins (1995) shows, for example, how the computation involved in steering a large ship does not take place in the head of any particular individual, not even the captain, but in the coordination of the minds of different individuals equipped with navigational artifacts, such as landmarks, maps, phone circuits, and organizational roles. The relevant cognitive unit in this case is no particular individual, but the system "crew + relevant cognitive artifacts" as a whole.



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result or view produced by collective intelligence, collective wisdom itself need not be located in any particular unified center, whether a central committee or the head of a particular individual. The expression "collective wisdom" should thus be understood as a broad umbrella for both decentralized "wisdom of the crowds" phenomena, such as information markets and Google, and more classically centralized deliberative exchanges, such as those of a panel of experts. Intermediary scenarios – where collective wisdom is partly centralized, partly decentralized – are also conceivable. Wikipedia probably falls into the latter category, involving decentralized clusters of deliberating groups.

Wisdom and Truth

This volume for the most part leaves outside of its scope an important philosophical problem, which is that of the standard for wisdom and more specifically the standard for wise choices, decisions, or answers. Not every group decision or collective phenomenon is wise, and in that sense, there must be a procedure-independent standard by which to assess where and when the crowd or the group goes right or wrong. As said earlier, the idea of wisdom, collective or not, does seem to commit us to a thick standard by which to assess the quality of a decision or a judgment - something more than mere coherence or formal rationality. In most of the essays, the standard is simply posited and assumed without being further discussed. It is implicitly defined by the context: the reality of verifiable events for information markets; factual, historical, and scientific truth for Wikipedia entries; actual quality of the references and products for Google or eBay; actual quality of the decisions for deliberating groups. As we move from factual to moral and political questions, however, the standard becomes fuzzier and it becomes harder to assess whether it has been met. In the case of information markets, Oscars or election predictions are verified or fail to be verified empirically at a given point in time. In the case of Wikipedia, the degree of accuracy can be measured by comparing Wikipedia entries with those found in expert-written encyclopedias. For some entries, however, an expert-produced proxy for the "right" answer might not be readily available (expert-written encyclopedias rarely include entries on Paris Hilton or the latest hot political issue). Finally, there are questions where what we are trying to ascertain is not just the facts of the matter, or some causal relationship on which there might exist or come to exist a consensus among experts, but the moral validity of certain judgments. In such cases, the procedure-independent standard can only be postulated, not a priori identified. 13 It can be tempting in such cases to deny that it makes sense to speak of a procedure-independent standard of correctness. In politics, in particular, this might seem to mean that there is no truth beyond what the local consensus of a given people is at any

One could perhaps assume that the immorality of torture or racism serves as a local "fixed point" (to borrow Rawls's terminology) of our moral reasoning. Yet most moral and political questions are located in a gray zone where such fixed points are not available.



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given time or, to put it in the words of contemporary Sophist Stephen Colbert, there is nothing but "truthiness." ¹⁴

Some of the essays in this volume that specifically address the question of collective wisdom in relation to democracy endorse an epistemic approach to democracy – that is, a view of democracy premised on the assumption that there exists a procedure-independent standard by which to assess the quality of collective decisions. None of these contributions, however, devote much space to defending this assumption or interpreting all the potential meanings of a procedure-independent standard of correctness in moral and political matters. The standard for moral and political wisdom is generally posited to be a necessary premise, but it is in general little more than a placeholder and does not commit the contributors to a specific moral or metaphysical view. In particular, most of the authors remain agnostic as to whether the standard should be considered a universally valid truth, and what the relevant conception of truth would be in that case, or a context-dependent social construction.¹⁵

Principles and Mechanisms

This volume sets out to uncover the principles and mechanisms of collective wisdom. By "principles," we mean the theoretical logic and rules undergirding

- Abramowicz makes the interesting suggestion in his book *Predictocracy: Market Mechanisms for Public and Private Decision-Making* (2007) that we should use as a proxy for the standard of the "right" moral decision the actual decision to be made in the distant future by the head of some respected political institution or administration, which we think is moving in the direction of what we have to assume is moral progress of some kind. In the same diachronic vein, one could imagine that the standard could be the consensus of a more advanced society similar to ours. These ideas, of course, presuppose that there is such a thing as moral progress and an ability to agree on which institutions or societies embody it, at least for a given question.
- ¹⁵ For a more direct treatment of these questions in democratic theory, see, e.g., the work of David Estlund (1997, 2008), Alvin Goldman (1999, ch. 7 on democracy), Joseph Raz (1990), and Robert Talisse (2009). I would also mention my own work on the topic (Landemore in press, specifically the chapter entitled "Political Cognitivism: A Defense"). For an empirical approach to the standard of expert political judgments on foreign policy that can prove suggestive in assessing the judgments of groups of nonexperts, also see Philip Tetlock (2005). Finally, a large philosophical literature in the field of social epistemology addresses, among other things, the question of the meaning of truth in both the sciences and morality. For deeper philosophical investigations into the meaning of knowledge, information, and truth, and debates between "classical" social epistemologists (who focus on the epistemic goal of having true or at least justified beliefs) and "anticlassical" or postmodernist social epistemologists (who have no use for the concepts of truth and justification), see the landmarks in that field (e.g., Steve Fuller 1987, 1988, 1999; Alvin Goldman 1986, 1987, 1999; Philip Kitcher 1990, 1993, 2001), as well as publications in relevant journals (Synthese, Episteme: A Journal of Social Epistemology, and Social Epistemology: A Journal of Knowledge, Culture, and Policy). While many essays in this volume, and perhaps the volume as a whole, qualify as contributions to social epistemology, neither the contributions nor the volume as a whole were intended specifically as such. For a survey and discussion of the questions addressed by social epistemologists, see Goldman's (2006) article, "Social Epistemology," in the Stanford Encyclopedia of Philosophy, http://plato .stanford.edu/entries/epistemology-social/.