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THE EPISTEMIC CULTURES OF SCIENCE AND *WIKIPEDIA*:  
A COMPARISON

**ABSTRACT**

I compare the epistemic culture of *Wikipedia* with the epistemic culture of science, with special attention to the culture of collaborative research in science. The two cultures differ markedly with respect to (1) the knowledge produced, (2) who produces the knowledge, and (3) the processes by which knowledge is produced. *Wikipedia* has created a community of inquirers that are governed by norms very different from those that govern scientists. Those who contribute to *Wikipedia* do not ground their claims on their reputations as knowers, for they stand to lose nothing if and when their contributions are found to be misleading or false. And the immediacy of the medium encourages gossip and jokes. Hence, though we have some reason to believe that an invisible hand aids scientists in realizing their epistemic goals, we cannot ground our confidence in what is reported on *Wikipedia* on the fact that an invisible hand ensures quality. Nor is the information on *Wikipedia* aptly justified in a manner similar to the way testimony can be justified.

**1. INTRODUCTION**

Apparently, the *Wikipedia* article on Albert Einstein “averages about one hundred thousand views per day” (Ross 2008, 1). Clearly, given that *Wikipedia* is such a common way for people to get information, it is a site of interest for the epistemologist. Because *Wikipedia* is constructed through the efforts of many people, it is an apt focus of study for the social epistemologist.<sup>1</sup> My aim in this paper is to contribute to the epistemic analysis of *Wikipedia* by comparing the epistemic culture of *Wikipedia* with the epistemic culture of scientific inquiry.<sup>2</sup> As we will see, the two cultures differ markedly with respect to (1) the knowledge produced, (2) who produces the knowledge, and (3) the processes by which knowledge is produced. I also aim to explore ways in which we might justify our reliance on information from *Wikipedia*. My arguments concerning the epistemic justification of information gleaned from *Wikipedia* are negative, thus raising doubts about the veracity of such information. I argue that though we have some reason to believe that an invisible hand aids scientists in realizing their *epistemic* goals, we cannot ground our confidence in what is reported on *Wikipedia* on the fact that an

invisible hand ensures quality. Nor is the information on *Wikipedia* aptly justified in a manner similar to the way testimony can be justified.

## 2. COLLABORATION IN SCIENCE AND IN *WIKIPEDIA*

In an effort to develop an epistemology of *Wikipedia*, it is worth comparing this sort of epistemic collaboration with another common type of epistemic collaborative project, scientific collaborations. Collaborative research is quite common in science. Indeed, in some fields it is the norm (see Wray 2002).

Scientific collaborations, though, are a heterogeneous lot, differing along many dimensions. They range in size from the two person research team to the enormous research facility, like CERN or the Stanford Linear Accelerator Center (SLAC). In fact, collaborative projects involving a hundred scientists are not unheard of (see Wray 2002, Hardwig 1985, Knorr Cetina 1999). Further, as Paul Thagard (1999, 2006) notes, in science collaborative research is pursued for many different reasons. And collaboration serves many different functions in science. Sometimes it is pursued as a means to train or mentor young scientists. At other times it is a means to draw on disparate pools of knowledge that no single individual possesses. And certain types of knowledge may only be attainable if we are prepared to collaborate (see Wray 2007). Some research projects run for years and require the concerted efforts of many scientists, engineers, and support staff (Knorr Cetina 1999).

Because we are well on our way to developing an epistemology of collaborative research in science, it is worth highlighting some of the differences between collaboration in science and the sort of collaboration that gives rise to *Wikipedia*. I want to draw attention to three key differences between these two cultures.

First, *Wikipedia* and science have very different objectives and aim to produce very different epistemic products. Scientists are working at the frontiers of knowledge, investigating issues and questions for which answers are not yet settled (see Cole 1992, 118; Latour 1987). *Wikipedia*, on the other hand, is concerned to make information about settled issues widely available (see *Wikipedia*, “Wikipedia: About”). *Wikipedia* eschews the frontiers of knowledge by design. It is not intended to be a venue for announcing new discoveries. To use Bruno Latour’s (1987) apt terms, *Wikipedia* is concerned with ready made science (or knowledge) rather than science (or knowledge) in the making.

Second, the producers of knowledge in these two domains are very different. The producers of scientific knowledge have traditionally been trained experts with reputations and careers to protect. These days, in many fields, there are teams of such people working together. And the findings that are reported are subject to the critical scrutiny of other experts in the field. Indeed, it is widely recognized that only scientists are capable of judging other scientists’ work (see Kuhn 1996).<sup>3</sup> The knowledge in *Wikipedia*, on the other hand, is created by a mass of people, many with no reputation to lose and no career as a certified or credentialed knowledge-maker that can be adversely affected if one were found to be negligent in one’s

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contribution to the community. In fact, by autumn 2007 there were “more than 75,000 active contributors” to *Wikipedia* (*Wikipedia*, “Wikipedia: About”). Further, it seems that the identity of the contributors is impossible for the casual user to determine (see Seigenthaler 2005), thus protecting careless contributors from being punished for their epistemic mishaps.

Third, the process by which the knowledge is created in these two venues is significantly different. Science is built on a public record of past achievements, achievements that were constructed in a similar manner by similar people. And, as Kuhn (1996) notes, in developed fields of scientific inquiry, research communities are, to a very large degree, self-policing. The training required to make a contribution in many fields ensures that very few people are qualified to assess the merits of a reported finding. The epistemic authority of scientists is, to a large degree, a function of the fact that scientific knowledge is esoteric.

*Wikipedia*, on the other hand, is open to contributions from all, and subject to revision by all. The site reports with pride that “visitors do not need specialized qualifications to contribute . . . [This] means that people of all ages and cultural and social backgrounds can write Wikipedia articles.” (*Wikipedia*, “Wikipedia: About”) Many are apt to find the democratizing of knowledge embodied in the construction of *Wikipedia* liberating. Sometimes scientists are portrayed as dangerous technocrats, ready to rationalize any decision they are asked to rationalize, and ill-equipped to make *moral* judgments about the consequences of their research.

Clearly, these are two very different epistemic cultures. And it should not be surprising that on careful examination we find they each have their own ethos.

### 3. IS THERE AN INVISIBLE HAND AT WORK?

It is worth examining how we might justify our trust in what we read in *Wikipedia*. Not surprisingly the site does not provide such a justification. Answering such a question would seem to lead one into the frontiers of knowledge, something that *Wikipedia* explicitly claims to eschew. Still, I would like to explore a possible answer.

Clearly, people’s reliance on *Wikipedia* cannot be based on the credibility of the author or authors of the articles, for, as mentioned above, it is difficult to determine who the authors are. Without knowing their names, one is not even in a position to assess their credentials, which may be some indication of their epistemic authority. Indeed, the one thing, and perhaps the only thing, people can be confident about is that the author has access to the internet. The fact that one cannot calibrate the reliability of those reporting the information posted on *Wikipedia* in a direct way, though, should not surprise us. After all, few of us are in a very good position to calibrate most people’s claims to knowledge on many subjects. As Steven Shapin (1994) notes, trust is ubiquitous in knowledge economies. Consequently, trusting what others report is the default position in well ordered communities.

Perhaps the epistemic reliability of *Wikipedia*, a reliability that is taken for granted by those who consult the source for information, is based on some sort

of *invisible hand justification*. Let me explain the general structure of an invisible hand explanation. “An invisible-hand explanation explains what looks to be the product of intentional design as not being brought about by anyone’s intentions” (Nozick 1974, 19).<sup>4</sup> For example, as Adam Smith noted, bakers tend to bake high quality bread for consumers to eat not because they care for the welfare of consumers. Indeed, they may not even know their customers, let alone care for their well being. Rather, bakers bake high quality bread because they care for their own welfare, and they know that unless they produce quality bread, they will not be able to sell their product and thus not be able to provide for themselves in a competitive market (see Smith 1776/1970). The high quality bread is a consequence that is derived from their effective pursuit of their own interests, profit.

An invisible hand justification of *Wikipedia* is built on the recognition that there is no person or group of people overseeing the project and thus guaranteeing the quality or reliability of the information posted in the articles. Such a justification would ground our trust in what is reported in the coordination of the interests of those contributing and those using the source, and specific environmental conditions. We are to trust that the knowledge-market will take care of itself, and poor articles reporting false claims will be rooted out. With many watchful eyes, and many eager to ensure that the truth is known, any falsehoods reported in the articles will be corrected expediently. Indeed, to some degree, it seems readers are to be persuaded to believe what they read on *Wikipedia* because so many people are involved in the process. And with so many people at work on the project, success seems guaranteed, at least in the long run. With all these people busily attending to various parts of the larger project, there is no need for a coordinator or overseer to ensure that only the truth is posted.

This faith in the operation of the system captured in the invisible hand justification outlined here certainly represents the view of one of the founders of *Wikipedia*, Jimmy Wales. As John Seigenthaler (2005) explains, Wales insists “that his website is accountable and that his community of thousands of volunteer editors ... corrects mistakes within minutes.” The view that the truth will win in the long run seems to be a persistent article of faith amongst epistemologists, endorsed by John Stuart Mill (1859/1956) and Paul Feyerabend (1988), among others. Philip Kitcher, though, expresses (1997) some skepticism that the truth wins in all domains.<sup>5</sup>

It is worth comparing the invisible hand justification I have sketched here with the typical invisible hand explanation for the success of *science*. David Hull (1988, 2001) argues that science is structured such that the interests of individual scientists coincide with the interests of science the institution. The sorts of things that scientists need to do in order to advance their own careers as scientists lead them to behave in ways that make them effective and reliable knowledge producers. Hull, though, is quick to note that science is very different from other institutions. For example, when politicians act in self-serving ways, to ensure they are re-elected

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and thus remain in power, seldom does it have a long term positive impact on their constituents.

The success of science is, to a large degree, a consequence of the fact that scientists work for recognition, but recognition of a very specific sort, peer recognition. They want other scientists to recognize them for their scientific research, preferably by citing it in their own work. The best way to get this sort of recognition is to produce good research, research that is reliable and relevant to the work of others. Indeed, this is really the only way to get this sort of recognition.

And the sure way to not get such recognition is to develop a reputation for producing unreliable research, research that cannot be trusted. Indeed, scientists who are known as unreliable are essentially ostracized from the research community. Their projects are deemed not worth funding, they are not worth collaborating with, and their research is not worth reading. It is because the recognition that scientists seek is only given to those who produce good research that science works so effectively. The invisible hand of science takes care of things. Personal interests coincide with institutional interests, a coincidence that we do not find everywhere in society.<sup>6</sup>

But even in science, collaboration can lead to problems. For example, it seems that it is more difficult for scientists to be held accountable when they work as part of a large research team. When something goes wrong, or appears to have gone wrong, it can be difficult to determine who is to blame (Wray 2006). Indeed, when research is being done by a team of 30 scientists, the matter can be very hard to resolve. Even in small research groups, it can be very difficult to catch mistakes. In February 2006, four scientists published an article in *Science* (Deb et al. 2006). In July 2007, three of the authors of the paper published a letter retracting the earlier article they published (Roberts et al. 2007). As the three authors note in their letter of retraction, “an investigation found that the first author (K.D.) engaged in research misconduct by intentionally falsifying and fabricating digital images in the preparation of [various figures] ... accompanying [their 2006] *Science* article.” (450) Further, the three scientists note that “the original raw image files for the majority of the figures in the paper have not been located.” The authors of the retraction explain that they “decided to withdraw the article in its entirety in view of the fact that the paper was founded at least in part on falsified or fabricated images.” The letter continues: “the corresponding author [of this letter of retraction] (R.M.R.) takes responsibility for placing *excessive trust* in his co-worker and for not assuring that a complete set of raw data existed at the time that the questions first arose about the paper.” (450; emphasis added) As this incident illustrates, in collaborative research projects, it can be very difficult to determine who is to blame when something does go wrong (see Biagioli 2003).

This concern about collaborative research in science reminds us that essential to the reliability of findings reported in journals are the scientists, that is, the people who produce the findings. They ground the findings they report on their reputations as dependable knowers, and even stake their careers on their reliability.

The ethos of the community contributing to *Wikipedia* is profoundly different from the ethos of scientific research communities. In the world of *Wikipedia*, peer recognition does not have the same function. Individuals do not depend for their reputations and careers as knowledge-makers on producing work that is recognized and used by others. Indeed, strictly speaking, contributors are not making knowledge but providing testimony. Hence, those contributing to *Wikipedia* lack the sorts of incentives that keep science in good working order. The costs of mistakes to those who make them in *Wikipedia* are minimal. Indeed, the cost may be nothing. Contributors certainly do not alienate themselves from the epistemic community, as careless scientists do. And their livelihoods are not threatened, as is the livelihood of a negligent scientist. In this respect, the invisible hand justification for the reliability of *Wikipedia* sketched at the beginning of this section seems implausible. We have very little reason to believe that an invisible hand is at work, ensuring that the truth, and only the truth, is made available.

#### 4. THE RUSH TO PUBLISH AND THE RUSH TO POST

I want to examine another difference between science and *Wikipedia*, the way in which the rush to be first is manifest in each culture. In science, there are great pressures to be the first to make a discovery, or, more precisely, the first to publish. In the culture of *Wikipedia* it seems there is a comparable rush to be the first to post a fact. Examining this dimension of the two cultures reveals aspects of the ethos of each culture.

It was Robert Merton (1942) who first drew attention to the *ethos* of science. Rightly, he recognized that science is a culture, and scientific knowledge a collective accomplishment, though the norms he focused on, universalism, communism, disinterestedness, and organized skepticism, are highly contested. Still, it is now widely recognized that scientists function in a sub-culture guided by norms that encourage certain types of behaviors, in particular, behaviors that generally advance the goals of the community. But, as Merton (1957) astutely notes, even efficient and effective social systems are not functional in every respect. Social systems can also inadvertently give rise to dysfunctional behaviors, behaviors that undermine the effective realization of the goals of the social system.

In science, the reward system has given rise to a number of dysfunctional behaviors. The rush to publish, for example, has occasionally led to the premature publication of findings that later need to be retracted. Publishing one's research serves the important function of making one's research available to others. But, as Merton notes, the ethos surrounding publishing can and has "become converted into an itch to publish that . . . becomes aggravated by the tendency . . . to transform the sheer number of publications into a ritualized measure of scientific or scholarly accomplishment." (316)

Priority disputes that are a consequence of the rush to publish are also dysfunctional in some respects, wasting scientists' energies on non-productive

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matters. Perhaps Leibniz and Newton could have made even more discoveries if they had not wasted their time and energies on disputing who discovered the calculus. Indeed, as Merton (1957) points out, when priority disputes depend on weeks or days, “priority has lost all functional significance.” (322)

There are similar dysfunctional practices in the culture of *Wikipedia*. Here, I want to focus on just one, the rush to *post*. There seems to be prestige attached to being the first to post facts, even though the identity of the contributor is not made public as it is in science. As a consequence of the value attached to posting first, it seems that *Wikipedia* is, to some extent, a site for gossip. Indeed, it seems that it is because the identity of those contributing is protected that gossip is encouraged.

I want to illustrate this concern by way of an anecdote. A few years ago I was going to host a distinguished speaker from another university and I wanted to make sure I had accurate information on her background and her books for the flyer we were producing to promote the event. Typing her name into Google, I expected to get her university webpage. To my surprise, the first hit I got was a *Wikipedia* article. I was able to get the publication date I was looking for, but reading the article, I also discovered that she had accepted a new position at another university across the country, which would affect the costs of our hosting her. I contacted her to congratulate her, to which she replied that the hiring process was not yet complete. Hence, contrary to what the *Wikipedia* entry suggested, she had not accepted a new position. Clearly, the author of the *Wikipedia* article was far ahead of himself. The contributor must have been overcome by the excitement at being “in the know,” even when his identity might remain concealed. Indeed, I suspect that there was a significant breach of privacy somewhere, a breach that could have jeopardized the process.

It is hard to imagine something like this occurring in a science journal. Breaches of norms do occur even in science. The alleged discovery of cold fusion was initially announced in the popular press, rather than in a scientific journal. This is contrary to the norms in science. In science, alleged discoveries are supposed to be scrutinized by scientific peers first. They are the only ones qualified to assess the claims that are being reported at the research frontier. This episode served as an important reminder to scientists why it is best to communicate findings to peers first. The integrity and the epistemic authority of science and scientists depend, to a large extent, on scientists keeping order in *their* community. The widespread outrage in the scientific community at the cold fusion case was largely a function of the fact that the scientists who made the alleged discovery failed to subject it to the scrutiny of the informed experts first.

## 5. A PUCKISH CULTURE

There is another difference that divides these two epistemic cultures that is worth mentioning. Like it or not, *Wikipedia* encourages puckish behavior. Dixie Andersen (2006) cites the case of the now-removed *Wikipedia* biography of

John Seigenthaler. As Andersen notes, the entry, which “remained online for ... four months,” “asserted that [Seigenthaler] was suspected of involvement in the Kennedy assassinations.” In fact, the entry was only removed “after Seigenthaler himself became aware of the article” (4).

Until I read Andersen’s article, I had never heard of John Seigenthaler. But I had no reason to think he was “directly involved in the Kennedy assassinations” (quoted from *Wikipedia* by Seigenthaler 2005). As Seigenthaler explains, he was in fact an administrative assistant for Bobby Kennedy, as well as one of his pallbearers. Hence, the posted entry was a joke of some sort, but clearly not the sort of joke Seigenthaler appreciates.

Seigenthaler recounts the difficulties he encountered as he tried to have the truth set straight. The same information was posted at two other websites, Reference.com and Answers.com. Further, much to Seigenthaler’s dismay, he had been unable to determine the identity of the author of his *Wikipedia* biography. The people who manage *Wikipedia* did not even know who the author is. Indeed, even with the help of a lawyer, Seigenthaler was unable to obtain information about the author. Ultimately, the author, Brian Chase, was found. Indeed, he reported himself in a letter to Seigenthaler. In addition to telling Seigenthaler that he meant no harm by the prank, Chase explains that “he thought Wikipedia was a ‘gag’ Web site” (see Seelye 2005).<sup>7</sup>

In science there is no room for jokes like this. Indeed, the closest incident to such a joke is the Sokal affair. But, in this case, Alan Sokal, a scientist, did not attempt to publish his joke in a science journal. Rather, his “joke,” if it can be called that, was intended to expose the unscientific nature of analyses of science in culture studies journals, specifically the journal *Social Text*. Sokal sought to demonstrate the editors’ appalling ignorance of science, thus showing they have no authority to publish articles allegedly describing science and how it works.<sup>8</sup>

Again, this difference draws attention to how radically different science is from *Wikipedia*. Clearly, many of us know this, especially those of us who study science. But it is far from obvious to most of the consumers of information on *Wikipedia*. It seems that most consumers of the information on *Wikipedia* do not realize that there are vast differences between the culture of *Wikipedia* and the culture of science.

## 6. TESTIMONY AND *WIKIPEDIA*

Before closing, I want to examine an alternative justification for the alleged reliability of the information on *Wikipedia*, one based on comparing information on *Wikipedia* to information gained through testimony.

As Richard Foley (1994) notes, there are two views on the justification of testimony. Historically, the dominant view is epistemic egoism. According to the epistemic egoist, belief based on testimony is only justified if there is either (I) some other evidence supporting the claim made or (II) evidence supporting the epistemic



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authority of the person making the claim (54–5). For example, when a stranger tells me a tornado is coming, given that I can also see the sky darkening rapidly, his testimony gives me reason to believe that a tornado is in fact coming. And knowing that Jane is a medical doctor gives me reason to believe that I have been in contact with poison ivy when *she* tells me the rash I have was caused by poison ivy.

An alternative view is non-egoism. According to the non-egoist, sometimes it is reasonable to believe what others report even when one does not have (i) evidence that the person making the report is reliable nor (ii) independent evidence supporting the claim they make (54–5). On this view, even though the sky is not darkening, the mere fact that a stranger tells me a tornado is coming gives me reason to believe that one is coming, other things being equal.

Foley defends non-egoism, arguing that “when I have reasons to believe you have opinion *p*, this gives me at least a weak reason to have opinion *p* myself.” (66) According to Foley, “I don’t need special reasons to trust your opinion . . . because, *all else being equal*, it is incoherent for me not to trust you, given that I trust myself.” (63, emphasis added) As far as Foley is concerned, it is inconsistent to trust oneself and not extend that same trust to others. You are, after all, like me, another *person* in the world, with comparable cognitive capacities.

Perhaps one of these two ways of justifying one’s reliance on testimony might provide a means to justify one’s reliance on information from *Wikipedia*. Let us consider such a strategy of justification, beginning with the traditional egoist justification of testimony.

I am inclined to think that if one has independent evidence supporting what is reported on *Wikipedia*, it is the independent evidence that is doing most of the epistemic work.<sup>9</sup> Hence, if we can justify our reliance on testimony in an egoist manner, then it will be in virtue of some evidence supporting the epistemic authority of the person offering the testimony.<sup>10</sup>

Those who defend egoism emphasize the need to know the *character* of the person making a claim in an effort to determine whether one is justified in believing what a person reports. For example, David Hume (1748/1977), a typical egoist, suggests that when we are assessing the testimony of others we should consider “the character and number of witnesses . . . [and] the manner of their delivering their testimony” (75). Because many people who rely on *Wikipedia* for information tend to know nothing about the contributors, a justification modeled on the egoists’ justification of testimony does not look promising.

Let us see whether a justification modeled on the non-egoists’ justification of testimony fares better than the egoists’ strategies of justification. Perhaps what is posted on *Wikipedia* is a testimonial report and, other things being equal, one is justified in believing what is reported even though one does not know who posted the information.

The problem with this path to justification is that *all else is not equal* in this case. As we saw above, there is some tendency to gossip on *Wikipedia* as well as a tendency to report falsehoods for amusement. Hence, we have to be especially

cautious about what is posted on *Wikipedia*. Perhaps it is not even apt to describe it as an account of what some person, we know not whom, believes. In this respect, perhaps it is not aptly described as testimony at all.

One might object that I am holding *Wikipedia* to an unreasonably high standard. After all, many popular sources of information contain falsehoods. Indeed, a study in *Nature* suggests that *Encyclopaedia Britannica* is only slightly less likely to contain errors than *Wikipedia* (Giles 2005). But, contrary to what this objection suggests, often we have some sense of the person or people standing behind messages in other contexts. With *Wikipedia*, though, there is no person behind the claim. Indeed, each article was written by someone or some group of people. But we know almost nothing about this person or these people and nothing about their intentions. Testimonial evidence, on both the egoist and non-egoist account, is the testimony of *someone*. But *Wikipedia* and the culture surrounding it has presented us with a situation where the link between the information and the people responsible for posting it is too tenuous.

Thus, it seems unlikely that we will be able to construct a compelling epistemic justification for the information on *Wikipedia* modeled on a justification of beliefs formed on the basis of testimony.

Indeed, not only do we have reason to doubt the veracity of what we read on *Wikipedia*, in certain circles, association with *Wikipedia* seems to undermine perceptions of one's epistemic integrity. Sage Ross (2008), an aspiring historian of science, reports that "Wikipedia's current reputation in the academy is worse even than blogging." Apparently, "talented graduate-student Wikipedians ... hide their real-life identities online and conceal their online identities among colleagues, for fear of ruining job prospects." (6) Hence, though *Wikipedia* appeals to the wider public, to those who work at the research frontier and those who want to build a reputation and career as a researcher, association with *Wikipedia* can be a liability.

## 7. CONCLUDING REMARKS

In summary, we ought to see *Wikipedia* for all that it is. In addition to being an easily accessible source of information and *misinformation*, it has created a community of inquirers who are governed by norms very different from those that govern other more familiar communities of knowledge *producers*. The people contributing do not ground their claims on their reputations as knowers. In fact, they stand to lose nothing if and when their contributions are found to be misleading or false. And the immediacy of the medium encourages gossip and jokes. If one had to wait months before one's contribution is posted, it is unlikely that gossip or jokes would be common. Hence, though we have some reason to believe that an invisible hand aids us in realizing our *scientific* goals, we cannot ground our confidence in what is reported on *Wikipedia* on the fact that an invisible hand ensures quality. Nor is the information on *Wikipedia* aptly justified in a manner similar to the way testimony

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can be justified. Unlike classic cases of testimony, it is difficult to ascertain the person behind the information posted.

Though my contribution to this issue has been critical of *Wikipedia* in its role in conveying knowledge, I think reflections on the epistemic merits of *Wikipedia* will prove to be useful. What *Wikipedia* can do for us is to draw greater attention to epistemology and its relevance to our place in the social world. Though we live in a time in human history when knowledge may be easier to obtain than ever before, we are in desperate need of means to sort and evaluate what passes for knowledge.

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## NOTES

- 1 *Wikipedia* has already been subjected to scrutiny by epistemologists. See, for example, Fallis (2008).
- 2 I do not mean to suggest that there is one epistemic culture in science. As Karin Knorr Cetina (1999) rightly notes, different fields and sub-fields have profoundly different

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cultures. Still, the differences between scientific fields are minimal compared to some of the differences between scientific cultures and the culture of *Wikipedia* that I will be discussing.

- 3 Steve Fuller (2000) argues that, even if the public is not in a position to judge the *epistemic* merits of some new finding reported by scientists, they are in some position to judge what research ought to be done. And, given that much scientific research is funded by money raised from taxes, scientists ought to be accountable to the public. Even this claim, though, is contentious. A certain degree of scientific literacy may be required in order to participate in an informed discussion of the relative merits of supporting one line of research rather than another. For example, the public may be inclined to support cancer research over some other research projects, despite the fact that the other projects may yield results faster and with greater benefits.
- 4 Elsewhere I have proposed the following characterization: “in an invisible hand explanation a particular outcome is described as an unintended consequence of the intentional behavior of a number of individuals. The individuals have one end in mind, and act accordingly; but their concerted efforts give rise to a consequence that was no part of their intentions” (Wray 2000, 164). The key to invisible hand explanations is that direct explanations, explanations in terms of agents’ intentions to realize the very goal that we seek to explain, fail or seem implausible. The invisible hand thus picks up the slack, explaining an effect that could not be realized given the intentions of agents, except as an unintended consequence.
- 5 Kitcher (1997) is reluctant to believe that studies of “race” and intelligence will get us any closer to the truth. For a critical discussion of Kitcher’s view, see Wray (2001).
- 6 Robert Merton (1973) also develops an invisible hand explanation for the success of science. And Latour and Woolgar’s (1986) cycle of credit is also an invisible hand explanation. On their view, those who produce good research get access to funding and resources, which in turn enables them to produce more good research. Ineffective researchers never get the cycle going, and those who produce unreliable research bring the cycle to an abrupt halt.
- 7 I thank Don Fallis for bringing Seelye (2005) to my attention.
- 8 Sokal’s motives were many. In part, he claims to represent the old left, a left that sees science as a liberating force. In contrast, Sokal suggests that the new left is skeptical about the power of science, and ignorant about its workings (see Brown 2001, 11).
- 9 There are new sorts of problems that arise with having *independent* evidence when one is talking about information from the web. After all, Reference.com and Answers.com apparently uncritically post what is posted on *Wikipedia*. A person seeking information may not know this, and have their doubts assuaged about what they read on *Wikipedia* because it was also reported on, and hence verified by, Answers.com. It is like consulting a friend’s copy of the *New York Times* in order to verify what it is that you read in your copy, but in the internet case the mastheads are not the same.
- 10 Deborah Tollefsen (2007) offers an egoist defense of group testimony, but, given her analysis, the community that contributes to *Wikipedia* might not be aptly described as the sort of group to which ascriptions of group testimony are apt. After all, unlike the United Nations Population Commission, for example, there is no spokesperson for *Wikipedia*, at least not one who stands behind what is reported as a representative of the

group. Indeed, it is far from clear that the community that contributes to *Wikipedia* has shared interests and goals.

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