Reply to Bricmont and Sokal:
Sometimes the obvious is the enemy of the true.

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Jean Bricmont and Alan Sokal say that I misrepresent them and that I also misrepresent Paul Boghossian; whereas I say that it is their misreading of me that causes them to think this. How, in any particular case, can a reader figure out who is right? I have no answer to propose except to urge close, skeptical and unhurried consideration of what each of us says. Read and reread. In cases of this kind, the obvious is the enemy of the true.

Intellectual debate? I am accused of using emotion-laden militaristic language to talk about intellectual debate. But, in the one case mentioned, which I discuss below, there is no militaristic language—only a tongue-in-cheek allusion to Bricmont and Sokal's seemingly hostile attitude toward the Strong Programme[1] and to the fatal consequences of accepting their criticism of it. When I do use militaristic language, like 'science warrior' or 'hatchet job', it is precisely to emphasize that what I am talking about is not intellectual debate but—I don't know a better way to put it—a hatchet job. But the focus here is on the Strong Programme, not French postmodernists or the editors of *Social Text* or even Bruno Latour, and I make it clear in my review that this conversation, in which Bricmont and Sokal are active participants, contains no hatchet jobs.

Boghossian's Ken Starr imitation: Before rejecting my comparison of Paul Boghossian's treatment of Roger Anyon to that of a reckless prosecutor, Bricmont and Sokal might have asked themselves why I consider it apt. The relevant distinction is between wanting to discover the truth, wherever this may lead, and wanting to make a certain charge stick, as Starr apparently wanted to do with Clinton.[2] Instead of carefully weighing the evidence pro and con—as one might expect an analytic philosopher to do, no matter how much he may desire a particular outcome, Boghossian went after Anyon with reckless zeal, the quality of his evidence and arguments be damned.[3]

Reading Jane Gregory: Bricmont and Sokal consider the dispute about Jane Gregory's remark a minor matter. I do not. Their criticism presumes, without a shred of evidence, that Gregory, co-author of 'The Public's Role in the Science Wars', was so ignorant about the science wars that she did not even know that the Sokal of Sokal's hoax is a card-carrying metaphysical realist and, therefore, would never say that a scientific statement can 'become true'. The implausibility of this presumption is one of my two reasons for believing that Gregory did not attribute the offending metaphysical view to them. The other is that she did not attribute *any* metaphysical view to them. Perhaps the simplest way to see this is to notice that, in the remark, the relevant part of which reads, 'the end product is usually well on its way to becoming what Bricmont and Sokal might call "reality" or "truth"', the expression, 'Bricmont and Sokal', makes its appearance *after* 'becoming', not before. Therefore, unless it is written in Hebrew or Arabic, it would require an extremely clever reading on the part of Bricmont and Sokal for the remark to imply that they hold some view, no matter which, about anything

becoming anything. But they don't have *any* reading of Gregory's remark, much less a clever one.[4] They merely believe that it implies that they are not metaphysical realists, an implication they seem to find too obvious to require justification. Here too, the obvious is the enemy of the true.

Death and the Strong Programme: Bricmont and Sokal complain that I do not give any evidence that they wish to see the Strong Programme dead.[5] This is true. I did not think it was necessary and I still do not. But I'm happy to oblige. The remark has less to do with 'emotion-laden' matters—like whether or not the Strong Programme irritates them the way they irritate me—than with their repeated statements about what would become of it were their criticism of it were to be accepted. For example, in *The One Culture?* (46), they say that 'science studies practitioners are not obliged to persist in a misguided epistemology; they can give it up and go on to the serious task of studying science'.[6] But, as they know, if the practitioners give up its distinctive epistemology, they give up the Strong Programme.[7] Therefore, if they would like to see their criticism of the Strong Programme accepted, then they would like to see it become what it is not. True, practitioners could then 'go on to the serious task of studying science', but not within the framework of the Strong Programme, which would no longer exist.

A long and sensible chapter? Bricmont and Sokal note that Michael Lynch discusses Sokal's one-line invitation to social 'conventionalists' to jump from his window but not their fifty-six page chapter in *Fashionable Nonsense* about the philosophy of science (Sokal & Bricmont 1998: 50-105). As I explain in the review, in the same discussion, Lynch characterizes the metaphysical discourse of the science wars, of which Sokal's quip is a notorious example, as 'sandlot' philosophy, in the sense that few of the participants are professional philosophers. Later, David Mermin says that his physicist colleagues, Bricmont and Sokal, 'clearly delight in sandlot philosophy', adding that he too likes to play. Perhaps Bricmont and Sokal now wish to suggest, without coming right out and saying it, that the chapter in *Fashionable Nonsense* shows that they are more sophisticated philosophers of science than the label 'sandlot philosopher' might lead one to think. Moreover, in support of this assessment, they have the testimony of such luminaries as Noam Chomsky, who calls the chapter 'a thoughtful and constructive critical analysis of fundamental issues of empirical inquiry' and Thomas Nagel, who calls it 'long and sensible'[8].

However, I see it differently. In my view, although Bricmont and Sokal are to be commended for their discussions of Popper and Kuhn, when they turn to skepticism, underdetermination, relativism, any of the issues related to Bruno Latour or the Strong Programme, they misjudge the limits of their competence, with predictable consequences.[9] I am aware that to question someone's competence rather than merely criticize particular applications of it may, like a charge of irrationality, seem to verge on an *ad hominen*. But in this case, it means no more nor less than it says. If I have had anything distinctive to say about the science wars, it is the importance that I attach to the failure of my professional colleagues, the science warriors, to recognize the limits of their competence to read and reason intelligently about certain texts that are outside their professional domains. Even when I criticize their most egregiously unjustified readings, my point is not that they should have been able to do better but that they should have known better than to think they could. Indeed, I am no more competent to read many of these texts than those whose readings I criticize.[10] But I recognize this and try to act accordingly. I

also recognize that professional certification does not guarantee success. In the science wars, some of the worst offenders are academic philosophers.

Incommensurable but not incompatible: Bricmont and Sokal take issue with a claim of incommensurability that I make, reminding us that the descriptive and normative notions of reasoning are, or at least seem to be, compatible. But I talk about incommensurability, not incompatibility, which is a very different thing. For example, the two mindsets for mathematics that I talk about in my reply to Collins are incommensurable but the associated bodies of mathematics produced in each are compatible—albeit in incommensurable ways.[11] Similarly, Bricmont and Sokal call attention to the compatibility of the descriptive and normative notions of reasoning in the teleological mindset but they also are compatible in the naturalistic one.[12] What is treated in the former as a fact about correct reasoning is accommodated in the latter, without loss of information, as a belief about correct reasoning. If Bricmont and Sokal wish to object that the naturalistic mindset fails to do justice to the normative conception of reasoning, I agree. But the other half of this truth is that the teleological mindset fails just as badly to do justice to the descriptive one.

How does evidence help make us believe that it is evidence? In the review, I say that, to use an explanatory scheme they seem to favor, Bricmont and Sokal must show that the *fact* that something is evidence, which is a state of the world, is a partial cause of the *belief* that it is evidence, which is a state of mind. I also say that not only do they fail to do this, they write in a way that conflates the two states.[13] In reply, Bricmont and Sokal point out that, 'far from conflating evidence with belief', they know very well that the relationship between the two can be very complicated. But this is not the conflation that I am talking about! I say that they conflate *the fact that something is evidence* for a belief with *the belief that it is evidence* for the belief and they reply they do not conflate evidence for a belief with the belief for which it is evidence. They give the right answer to the wrong question!

An example may make this clearer. Sokal treats it as uncontroversial that, to plausibly explain the shift in scientific belief from creationism to Darwinism, we must make reference to *the fact* that the fossil record provides evidence for the latter but not the former (Sokal 1998: 16). What *is* uncontroversial is that, to explain this shift in belief, we would expect to make reference to *the belief* that the fossil record provides such evidence. For Sokal to support *his* claim, he would have to do something that, with or without Bricmont, he apparently has never attempted, namely, to demonstrate how *the fact that* something is evidence for a certain belief helps make us *believe that* it is evidence for it. Thus, Bricmont and Sokal have an unhappy choice. They can either continue, ostrich-like, ignoring the crucial distinction between the fact and the belief that something is evidence for a belief or they can face up to it and try to show, in even one case, that evidence did play a necessary causal role in helping to convince people that it is indeed evidence. But this, I think, is a fool's errand. It is, in effect, where they came in—promising to show us that, in some cases, we must appeal to the truth of a belief to help plausibly explain the belief that it is true. The only new twist here is that it is the truth of a belief that something is evidence for the truth of another belief. Is this progress?

A serious charge, but also a curious one: In the review, I discuss two cases in which Bricmont and Sokal claim that to explain what makes somebody hold a certain belief, it is

necessary to appeal to the fact that it is true. In my critique of these claims, I observe that Bricmont and Sokal offer no argument for either of them. They merely preface the first by 'it seems obvious that' and the second by 'certainly'.[14] But they dispute this, claiming that 'Stolzenberg carefully omits to mention the sentence immediately following the one he quoted, which is devoted *precisely* to giving an argument in support of the preceding assertion'. Even if we replace 'carefully' by the less paranoid-sounding 'carelessly', this is a serious charge. It also is a curious one because not only does the sentence they mention provide no such support, it doesn't even read as if it does. It doesn't even read as if *they* think it does.

The assertion in question is that 'part of the explanation [of why someone standing in the rain says, 'It is raining today'] involves the fact that it really is raining today'. The sentence that allegedly contains an argument in support of it reads, 'If someone said that it is raining when it is not, one might think that he is joking or that he is mentally disturbed,[15] but the explanations would be very asymmetrical depending on whether it is raining or not'. But, as Bricmont and Sokal well know, a description of unreflective responses that, in ordinary discourse, might be called 'explanations' cannot provide support for their normative claim that there is such a thing as '*the*' explanation of why a person standing in the rain believes that it is raining, part of which is that the belief is true.

Nevertheless, it is true that, when I wrote the review, I did not fully grasp what Bricmont and Sokal take themselves to be doing in these two sentences. Nor did their reply help, except to reveal that they did not understand my criticism and I did not understand why. But, having reconsidered the matter, it seems to me that, in their minds, the first claim, together with the sentence that I 'carefully omit to mention', is an argument against Bloor's symmetry principle that true and false beliefs are to be explained by 'the same' kind of causes (Bloor 1991: 7). However, I don't talk about the symmetry principle because I think that its wording invites misunderstanding.[16] I talk instead about the irrelevance of authenticity for explaining belief causation—in this case, of the fact that the belief is true. Because of this, the target of my criticism is not their argument, if that it what it is, against the symmetry principle but, as I make clear, their two claims about the necessity of referring to the truth of a belief in order to explain its causation. That Bricmont and Sokal think that I am mistaken when I observe, correctly, that these claims are supported only by 'it seems obvious that' and 'certainly' suggests that they do not understand that I am criticizing only the absence of support for *the claims themselves*, not for any role they are alleged to play in criticizing the symmetry principle.[17]

The irrelevance of authenticity for explaining belief causation: Judging by their reply, Bricmont and Sokal agree that no reference to the whiteness of a sheep, one side of which I see, is needed to explain what makes me believe in it: 'authenticity' is irrelevant. Yet they show no curiosity, much less concern, about what, if anything, is different about the beliefs in their two examples that makes it necessary to appeal to their truth to explain their causation. How can they justify saying that an appeal to the truth is necessary for local weather conditions but not for ewe hue? My impression is that, instead of continuing to insist upon the need for such appeals, Bricmont and Sokal are turning to other ways of persuading us of the superiority of their 'truth-based' explanations. One sign of this is their acknowledgment of the interest-relative nature of explanation; there is no more talk of '*the*' explanation and causes that

must be part of it, only of explanations that are deeper than other ones, or 'more adequate' or 'better' or 'based on simpler or more fundamental facts' or, my favorite, 'what one would quite reasonably want to know'.

But it is simplistic and even irresponsible to assert, as they do, that one explanation is better or more adequate than another one merely by virtue of being simpler or more fundamental, especially when the relevant senses, if there are any, of 'simpler', 'better', 'more adequate' and 'more fundamental' have not been explained. Worse, they ignore the crucial question of the *intrinsic* adequacy of an explanation—especially, of its causal mechanism. They do point out that, unavoidably, many aspects of the causal mechanism remain implicit 'until someone demands that they be made explicit and subjected to questioning'. Yet, one of the first things one notices about their alleged explanations of belief causation is that, at every point in a causal chain at which they go beyond the realm of Strong Programme explanations, there is a conspicuous absence of anything that deserves to be called 'a causal mechanism'.[18] I believe that, when such mechanisms are given in sufficient detail, far from strengthening Bricmont and Sokal's case, they will provide vivid proof of the irrelevance of authenticity by allowing us to see that they operate not only on the content of the belief but on any good enough 'imitation' of it.

A belief and how I came by it: I am inclined to see Bricmont and Sokal's rejection of my 'truth-based' explanation of my ewe hue belief (wherein the whiteness of a sheep 'explains' the whiteness of the side that I see) as evidence of their new, more flexible, approach. Although they still require that the truth of *some* belief plays a crucial explanatory role, it no longer has to be the one whose causation is to be explained. Thus, saying that my 'truth-based' explanation of my belief 'misses the main point', they propose to explain it instead in terms of how I acquired the more general belief that every sheep that is white on one side is white.[19] In the review, I was content to attribute this to 'my past experience', assuming that readers would fill this in much as I would. But I was mistaken. According to Bricmont and Sokal, an essential part of the story is that, a long time ago, I saw '*both* sides of a large number of sheep, and they were unfailingly monochrome'. But, even if something like this were true, which I strongly doubt,[20] the irrelevance of authenticity still rules. What insight into the process of belief causation is gained by knowing that the animals that I allegedly saw were not wolves impersonating sheep but authentic 'out there in reality independent of us' monochrome sheep?

A truly inadequate explanation: In yet another attempt to persuade us of the rightness of their causes, Bricmont and Sokal compare their 'truly adequate' explanation of the acceptance of Newtonian mechanics with their ungenerous representation of a Strong Programme one. In keeping with the new paradigm, whereas, before, we were encouraged to assume, falsely and unthinkingly, that we have an adequate understanding of what, if anything, is meant by '*the*' explanation of something, we are now encouraged to assume, falsely and unthinkingly, that we have an adequate understanding of what, if anything, Bricmont and Sokal mean by 'a truly adequate' explanation—so that when they tell us that this one is not truly adequate but that one is, we can look at the evidence and arguments they give us and make up our own minds.

The comparison is odd, interesting and revealing. It consists essentially in a 'one size fits all cases' sketch of their idea of how 'to explain scientist X's belief in some theory'. Pausing at

places where they imply, always falsely, that a Strong Programme explanation would stop, they object that it is 'not natural' to stop there because 'one would quite reasonably' want to go further and explain some of the 'facts' on which the explanation up to this point relies. Near the end, they stumble badly but do not notice.[21] Unsurprisingly, when it is sorted out,[22] the punch line of their explanation, the part that, in their eyes, renders it 'truly adequate', is that the results of certain experiments were E 'because E is approximately the way the world is'. I am not kidding and neither are they. But if you find, as I do, that it is 'not natural' to stop here because in the absence of a substantive account of *how* the fact that 'E is approximately the way the world is' helped make the experimentalists *believe that* their experiments yielded E, you 'quite reasonably' find what they say of little, if any, explanatory value, then for us, this 'truly adequate' explanation is, on the contrary, truly *in*adequate.

Endnotes for 'Reply to Bricmont and Sokal'

[1] An impression created in part by criticizing it in a book devoted to debunking 'fashionable nonsense'.
[2] I used Starr, not because his behavior was especially bad as these things go, it was not, but because it seems that almost everyone has heard about it.
[3] For example, even though he sees that his third reading of Anyon's remark gets him off the hook, instead of retracting his charge, he invents another, inconsistent with the first, that does apply to this reading.
[4] Their 'charitable reinterpretation' 'along lines similar to Stolzenberg's by referring to "evidence"' is not a reading of it but merely a thought evoked by the remark—one that, moreover, bears no interesting similarity to my reading of it. Yes, evidence usually figures significantly in a process of this kind. But, for the point in dispute, it could just as well consist in waiting for a word from God. Furthermore, what is called for is not a logical qualifier like 'conclusive' but a cognitive one like 'convincing' or 'convincingly conclusive'.
[5] I wrote, 'Three physicists, two of whom wish to see [the Strong Programme] dead and one who merely finds it boring, crippling and wrong-headed, attack it.' Lighten up, guys.
[6] Also, in *Fashionable Nonsense* (p. 92), we are told that, depending on how one resolves an ambiguity in the intent of the Strong Programme, 'it becomes either a valid and mildly interesting corrective to the most naïve psychological and sociological notions, reminding us that "true beliefs have causes, too" or else a gross and blatant error'. Thanks a lot! Finally, in support of my claim about 'repeated' statements, note that each of the two that are quoted here appears twice elsewhere, (Sokal, 1998: 17-18, Sokal, 2001: 24-25), for a total of six.
[7] See their argument that methodological relativism makes no sense without philosophical relativism.
[8] Chomsky's remark is on the book jacket. Nagel's is in his review of the book (Nagel, 1998: 33).
[9] However, if the criticism of their reply that I give here is not convincing, I doubt that my critique of their chapter will be any more so.
[10] In such cases, I almost always argue only that a reading is unjustified, e.g., by giving a different one that is no less plausible, not that it is incorrect.
[11] I do not know any way to confirm the incommensurability without learning to alternate between the mindsets. However, it is very easy to describe the two kinds of compatibility. In the classical mindset, constructivist mathematics is the part of classical mathematics devoted to seeing what can be proved without the law of excluded middle; whereas, in the constructivist mindset, classical mathematics is the part of constructivist mathematics devoted to seeing what follows from the law of excluded middle. So, in each case, the compatibility is that of part to whole. Each is a restricted subsystem of the other! However, because of the incommensurability of the mindsets, saying this does not do justice to either system.

[12] I am using 'teleological' and 'naturalistic' as in (Bloor, 1991: 5-14).
[13] Professional philosophers make the same conflation. E.g., Boghossian (2001: 8) writes, 'While it may be plausible to ignore the truth or falsity of what I believe in explaining why I came to believe it, it is not plausible to ignore whether I had any evidence for believing it'. What is not plausible to ignore is Boghossian's *belief* that he had any such evidence. Note also that whenever evidence helps to induce belief by inducing the belief that it is evidence, the first part of his statement *applied to his belief about having evidence* contradicts the second part *in its original form.* See also (Hacking, 1999: 232, note 13).
[14] An alert reader points out that I first say that there is no support for the weaker claim that, in each case, the truth of the belief is a partial cause of its acceptance, if not a necessary one. However, although I then thought better of opening this can of worms in the review, I forgot to remove the remark!
[15] I assume they mean to be giving only a sample of spontaneous reactions that people commonly have.
[16] It could be taken, as Bricmont and Sokal seem to take it, to imply that one cannot give a causal explanation of a belief until one has determined its truth value. Also, Bloor does not explain what he means by 'the same kind' even though any two things are of 'the same kind' in infinitely many respects.
[17] But, of course, criticism based on an unsupported claim is itself unsupported.
[18] E.g., because Sokal conflates the existence of evidence for Darwinism with the belief that it is evidence, he is blind to the need for a mechanism by means of which the truth of Darwinism helps make us believe it by making there be evidence for it *that helps make us believe it is evidence for it*.
[19] They also claim to explain why my belief that the sheep is white is true. But, if they do not wish to appeal to its truth to help explain why I hold it, this is pointless. Although they do not say why they reject this appeal instead of joining it with the explanation they prefer, it would not be too surprising if their devotion to such explanations was tempered by the consideration that treating 'the side is white *because* the sheep is white' as a causal relation runs counter to the intuitive idea that to cause something is to 'make' it happen. They do say that, in some cases, an explanation may take the form of a logical implication but I can easily imagine them declining to do so in this one.
[20] Indeed, I doubt that it had much, if anything, to do with sheep, except in the negative sense of my never seeing what appeared to be a counterexample.
[21] Unlike scientist X, Bricmont and Sokal are unwilling to accept without further investigation that the 'honest and conscientious' experimentalists, Y and Z, got result E 'because E is at least approximately the way the world is'. They see it as an empirical question, which can be investigated by competent scientists in the usual ways. But this is true *only if* we omit 'because' and, if we do, it no longer is an explanation! Also, until we have reason to trust the 'competent' scientists more than we do Y and Z, we have to allow that their investigation will have to be investigated by other competent scientists. And so on, *ad infinitum.* Bricmont and Sokal's talk (2001: note 9) of 'independent' assessments suffers from the same problem.
[22] E.g., by Bricmont and Sokal recognizing that they have no good reason not to trust Y and Z.

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