Editorial

When Is Science ‘Ultimately Unreliable’?

This past October, I published an editorial (Blatt, 2015) appraising the social media phenomenon of PubPeer. I raised several issues with the Web site that I maintain do not serve the scientific community and will only entrench many of the underlying attitudes and behaviors that PubPeer claims it seeks to counter.

The response to my editorial exceeded all expectations—in 18 days it garnered 348 comments,1 to date almost 3 times the number attached to any other article on the site. PubPeer founder Brandon Stell, and his colleagues Boris Barbour and Gabor Brasnjo, themselves felt compelled to write a defense of the Web site.2

PubPeer has since attracted further criticism, including an exchange with physicist Philip Moriarty published in Times Higher Education3 and a blog post4 from the science journalist Leonid Schneider. I was approached by the editors of RetractionWatch, which also accepts anonymous comments, and wrote a guest post, but the RetractionWatch editors subsequently stepped back from the debate, choosing not to publish the post.

At the heart of the issue, and of my Plant Physiology editorial, is whether the anonymous voice has a place in scientific critique. I maintain that it does not and, furthermore, that by promoting anonymous commenting, PubPeer undermines open debate that is the cornerstone of the scientific process.

As the Editor-in-Chief of Plant Physiology, the most highly cited journal in the plant sciences, and as a scientist still active at the bench myself and training many young researchers, I am deeply concerned that open debate is not lost, both for science today and for the community that this next generation will build in the future.

Putting aside the issues of policing for fraud and whistleblowing for the moment, there are a few standard arguments that are often paraded in favor of anonymous commenting. Decide for yourself if they are valid or vacuous.

(1) Many fear reprisal, especially if they are seen to question established authority. If true, this argument for anonymity is deeply depressing. Questioning data and ideas is the norm in science. Unless you are making an allegation of misconduct (and we’ve set this aside for the moment), it is possible, even as a Ph.D. student or postdoctoral researcher, to question a senior scientist openly, nonanonymously, in a way that is constructive and nonthreatening. Yes, there are individuals whose minds are closed—I suggest such individuals are not worth the trouble in any case—but usually the outcome is positive and benefits both. Ultimately, it is a warped worldview, indeed, in which scientists are so fearful of engaging that they never challenge others’ research and ideas openly, whether online or in publication.

(2) Anonymity ‘levels the playing field’ and is essential to redress inequities that pervade science today. Far from leveling anything, anonymity entrenches inequality in every situation, simply because one side is identified and the other is not. Rather than a formula to enrich debate, anonymity is a recipe that is guaranteed to degrade it. I noted in my editorial that “anonymity is intimidating … and the price often is an absence of worthwhile discussion.” Whatever the supposed inequities, the solution is not to further embed inequality. There is an old saying about two wrongs and what is right.

(3) Anonymity is essential to protect fundamental rights and free speech in a global democratic society. Yes, science is a “massively cooperative undertaking,” to quote one of my PubPeer commenters,5 but that does not mean it is democratic. Science requires substantial training; its foundations are logic and reasoning; it builds on the merits of knowledge and expertise; it is not a ‘one man, one vote’ endeavor with universal enfranchisement. To argue otherwise is manifestly absurd.

(4) The focus should be on the message, not on who presents it. Knowing who enters into a debate does matter, if only because the most appropriate response almost always demands some knowledge of the context and the background of the questioner. To my mind, anonymity also implies a lack of conviction and a refusal to engage meaningfully. As the psycholinguist Steven Pinker notes (Pinker, 2013, 2014), context is the core of social interaction.

(5) Challenging research through the traditional route of publication is time-consuming, onerous, expensive, and excruciatingly slow. Not an argument for anonymity per se, this is a common theme in support of anonymous postpublication review.2,3 I agree, it’s easy—and cheap—to pick apart someone else’s work. It is far more difficult to pick up the threads of the work and advance knowledge through research.

The real problem is that anonymity opens the door to abuse, sock-puppetry, and other nefarious and conflicted behaviors. As the basis for ‘scientific discussion,’ anonymous commenting quickly escalates de facto into trial by kangaroo court. Stell2 argues that I did not offer “concrete examples of abuse” in my editorial, and that PubPeer “does not allow ‘hearsay’, ‘allegations’ or invite ‘innuendo’.” Well, you need only review the comments to my editorial to see many examples of such behavior and what is so wrong with anonymity. One example, needless to say from an anonymous commenter, reads as follows.

Unregistered Submission:

(September 29th, 2015 5:24pm UTC)

Could this be a reason for this critical assessment of PubPeer by Prof. Blatt?

www.plantphysiol.org/cgi/doi/10.1104/pp.16.00160

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Oddly, Prof. Blatt does not allude to these papers in his editorial, or draw the attention of his readership to these issues. Why is that?

It was soon ridiculed, amusingly enough, by another anonymous commenter.

Unregistered Submission:

(September 29th, 2015 9:22pm UTC)

RE: Unreg @ September 29th, 2015 5:24pm:

“Could this be a reason for this critical assessment of PubPeer by Prof. Blatt?”

He laid out his reasons in the piece. He explained them thoroughly and clearly. You are suggesting an ulterior motive where none is necessary. That is conspiracy-theory thinking.

You can just carefully consider the arguments he makes, and decide whether you agree. He explained the basis for his opinions, and there is no need to imagine other motivations. Of course, you are free to have your own opinions, but ideally they would depend on logic, and a careful consideration of the pros and cons of the issues, rather than inventing some imagined chicanery in your own mind.

To wave away his entire piece and chalk it up to perceived slights is simply lazy, lazy, lazy.

(Ironically, if he wrote the piece anonymously, and posted it here on PubPeer rather than publishing it in a journal, you’d have to take the arguments on their substance rather than rely on lazy argumentation based on the identity of the author and journal.)

Of course, these examples are innocuous; even had they identified themselves, the commenters would never have been in danger of legal challenge, as Philip Moriarty repeatedly emphasized throughout the threads.1 You don’t have to look far, however, to find other instances of far more vicious behaviors in these same threads.

Although initially one of my fiercest critics,1 Leonid Schneider has come to see the anonymous voice on PubPeer as “counterproductive, even toxic,” as he notes in his recent blog post.3 He recounts witnessing “authors defending their own papers by anonymous sock-puppetting,” in which PubPeer selectively “interfered to delete such comments, but other suspicious posts were left standing,” and concludes that the “anonymity of PubPeer can be easily abused by less trustworthy commenters to hide their ulterior motives and conflicts of interest.”

Let me add that Leonid and I have continued to correspond since our first contact through PubPeer, contact that was nonanonymous, again demonstrating the benefits of open debate. We agree on the need to protect the whistleblower and are now working together to address the concerns of bona fide fraud, initially in a community-wide effort across the plant sciences. I hope to have more to say about how we will address the problem of fraud later this year. Anonymity is not the answer, however, not if due process is to ensure civil society and protect the innocent from denouncement or worse.

So why does PubPeer promote anonymous commenting? Stell and colleagues argue that anonymity is the most effective way of exposing the “ultimately unreliable” publications that they suggest are flooding the literature.3,4 But examine what is “ultimately unreliable,” and you soon uncover the misguided thinking behind the premise.

For example, Stell decries2 the fact that the 2011 article in Science about a microbe that purportedly used arsenic in place of phosphate (Wolfe-Simon et al., 2011) has yet to be retracted. True, it may be argued that the article should never have passed the review process. The study was shown to be flawed technically, and the conclusion of arsenic-based life was subsequently discounted, in part because the authors did not take account of low levels of phosphate impurities. However, there is nothing fraudulent about the data per se. Furthermore, far from ignoring the concerns of the community, Science stepped up to the debate to facilitate community awareness. Back-to-back with the article, the journal published seven critiques of the work, the authors’ rebuttal, and a note from Editor-in-Chief Bruce Alberts in June 2011. The Science article proved ‘ultimately unreliable’ only in the hyperbole of its interpretation. It stimulated research leading to important insights about a transporter that scavenges phosphate in the presence of exceptionally high levels of the structurally similar arsenate anion (Elias et al., 2012; Erb et al., 2012; Reaves et al., 2012).

Following such misguided logic, we should also retract from the literature many classics. Up for the chop, among others, are the studies of Cole and Curtis who, in the 1930s, identified the conductance changes during the action potentials in giant algae and squid axons but failed to correctly interpret these changes as reflecting discrete ion fluxes (Cole and Curtis, 1938, 1939); their work nonetheless paved the way for Hodgkin and Huxley’s seminal discoveries a decade later. We should also consider the very large body of research in mammalian physiology between the 1950s and 1980s, prior to the studies of De Weer and Gadsby (De Weer et al., 1988), that failed to recognize the contribution made to membrane voltage by the Na+/K+-ATPase. By the same argument, too, up for elimination is the substantial literature on Rubisco that has proven to be flawed but nonetheless contributed to our understanding of its structure, of carbon fixation, and of the associated glycolate cycle (Portis and Parry, 2007).

Obviously, retracting any of these studies would be ridiculous, not to mention senseless. Yet the arguments for doing so are identical to those for redacting the arsenic article. My point is that the science does not end with publication. Publication is only the beginning of scientific debate. Progress often arises from what, in hindsight, is ‘ultimately unreliable,’ and its cornerstone is open debate.

Michael R. Blatt
Editor-in-Chief
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