How to Publish a Scientific Comment in 1 2 3 Easy Steps

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The essence of science is reasoned debate. So, if you disagree with something reported in a scientific paper, you can write a "Comment" on it.

Yet you don't see many Comments, and many scientists complain that it can be very difficult to publish one. Some believe that this is because journal editors are reluctant to publish Comments because Comments reveal their mistakes—papers they shouldn't have allowed to be published in the first place.

Fortunately, in this article, I'll share with you my recent experience publishing a Comment, so you can, too. There are just a few simple steps:

1. Read a paper that has a mistake in it.

2. Write and submit a Comment, politely correcting the mistake.

3. After its review and eventual acceptance by anonymous learned reviewers, enjoy your Comment in print along with the authors' similarly reviewed and equally polite Reply, basking in the joy of having participated in the glorious scientific process and of the new friends you've made—the authors whose research you've greatly assisted and the editor whose journal you've helped to improve.

Ha ha! You didn't really believe that, did you? Here's the actual sequence of events:

1. Read a paper in the most prestigious journal in your field that "proves" that your entire life's work is wrong.

2. Realize that the paper is completely wrong, its conclusions based entirely on several misconceptions. It also claims that an approach you showed to be fundamentally impossible is preferable to one that you pioneered in its place and that actually works. And among other errors, it also includes a serious miscalculation—a number wrong by a factor of about 1000—a fact that's obvious from a glance at the paper's main figure.

3. Decide to write a Comment to correct these mistakes—the option conveniently provided by scientific journals precisely for such situations.

4. Prepare for the writing of your Comment by searching the journal for all previous Comments, finding about a dozen in the last decade.

5. Note that almost all such Comments were two to three pages long, like the other articles in the journal.

6. Prepare further by writing to the authors of the incorrect paper, politely asking for important details they neglected to provide in their paper.

7. Receive no response.

8. Persuade a graduate student to write to the authors of the incorrect paper, politely asking for the important details they neglected to provide in their paper.

9. Receive no response.

10. Persuade a colleague to write to the authors of the incorrect paper, politely asking for the important details they neglected to provide in their paper.

11. Receive no response.

12. Persuade your colleague to ask a friend of his to write to the authors of the incorrect paper, politely asking for the important details they neglected to provide in their paper.

13. Receive no response.

14. Ask the graduate student to estimate these parameters herself, and observe that she does a very good job of it, reproducing their plots very accurately and confirming that the authors were wrong by a factor of about 1000 and that their conclusions were also wrong.

15. Write a Comment, politely explaining the authors' misconceptions and correcting their miscalculation, including illustrative figures, important equations, and simple explanations of perhaps how they got it wrong, so others won't make the same mistake in the future.

16. Submit your Comment.

17. Wait two weeks.

18. Receive a response from the journal, stating that your Comment is 2.39 pages long. Unfortunately, Comments "can be no more than 1.00 pages long, so your Comment cannot be considered until it is shortened to less than 1.00 pages long."

19. Take a look at the journal again, and note that the title, author list, author addresses, submission date, database codes, abstract, references, and other administrative text occupy about half a page, leaving only half a page for actual commenting in your Comment.

20. Remove all unnecessary quantities such as figures, equations, and explanations. Also remove mention of some of the authors' numerous errors, for which there is now no room in your Comment. The archival literature would simply have to be content with a few uncorrected falsehoods. Note that your Comment is now 0.90 pages.

21. Resubmit your Comment.

22. Wait two weeks.

23. Receive a response from the journal, stating that your Comment is 1.07 pages long. Unfortunately, Comments "can be no more than 1.00 pages long, so your Comment cannot be considered until it is shortened to less than 1.00 pages long."

24. Write to the journal that, in view of the fact that your Comment is only ever so slightly long, and that it takes quite a while to resubmit it on the journal's confusing and dysfunctional web site, perhaps it could be sent out for review as is and shortened slightly to "1.00 pages" later.

25. Wait a week.

26. Receive a response from the journal, stating that your Comment is 1.07 pages long. Unfortunately, Comments "can be no more than 1.00 pages long, so your Comment cannot be considered until it is shortened to less than 1.00 pages long."

27. Shorten your Comment to 0.80 pages, removing such frivolous linguistic luxuries as adjectives and adverbs.

28. Resubmit your Comment.

29. Wait three months, during which time, answer questions from numerous competitors regarding the fraudulence of your life's work, why you perpetrated such a scam on the scientific community, and how you got away with it for so long.

30. Read the latest issue of the journal, particularly enjoying an especially detailed, figure-filled, equation-laden, and explanation-rich three-page Comment.

31. Receive the reviews of your Comment.

32. Notice that Reviewer #3 likes your Comment, considers it important that the incorrect paper's errors be corrected and recommends publication of your Comment as is.

33. Notice that Reviewer #2 hates your Comment for taking issue with such a phenomenal paper, which finally debunked such terrible work as yours, and insists that your Comment not be published under any circumstances.

34. Notice that Reviewer #1 doesn't like it either, but considers that its short length may have prevented him from understanding it.

35. Also receive the editor's response, pointing out that no decision can be made at this time, but also kindly suggesting that you

consider expanding your Comment to three pages and resubmitting it along with your responses to the reviews.

36. Expand your Comment back to three pages, replacing adjectives, adverbs, figures, equations, explanations, and corrections of author errors you had had to remove earlier to meet the 1.00-page limit. And, in an attempt to enlighten Reviewers #1 and #2, include a separate extended response to their reviews.

37. Resubmit your Comment.

38. Wait three months, during which time, receive condolences from numerous colleagues regarding the fraudulence of your life's work and how sorry they are about it having been debunked.

39. Fail to enjoy your colleagues' stories of other deluded scientists in history whose work was also eventually debunked, and try to explain that, in fact, you feel that you don't actually have that much in common with alchemists, astrologers, creationists, and flat-earthers.

40. Read the latest issue of the journal, which includes another detailed three-page Comment, almost bursting with colorful and superfluous adjectives and adverbs, some as many as twenty letters long.

41. Receive the second set of reviews of your Comment.

42. Notice that Reviewer #3 continues to like your Comment and continues to recommend its publication.

43. Notice that Reviewer #2 continues to hate it for taking issue with such a phenomenal paper, which finally debunked such terrible work as yours, and again insists that your worthless Comment not be published.

44. Note further that Reviewer #2 now adds that your Comment should *under no circumstances* be published until you obtain the important details from the authors that you confessed in your response to the reviewers you were not able to obtain and are not ever going to.

45. Realize that Reviewer #2's final criticism inevitably dooms your Comment to oblivion until such time as the authors provide you with the important details, your best estimate for which is never.

46. Notice, however, that Reviewer #1 now sees your point and now strongly recommends publication of your Comment. He also strongly recommends that your Comment remain three pages long, so that other readers can actually understand what it is that you're saying.

47. And, in an absolutely stunning turn of events, note also that Reviewer #1 writes further that he has also somehow secretly obtained from the authors the important details they neglected to provide in their paper and refused to send to you. Even better, using them, he has actually checked the relevant calculation. And he finds that the authors are wrong, and you are correct.

48. Realize that it is now no longer necessary to respond to the impossible criticism of Reviewer #2, as Reviewer #1 has kindly done this for you.

49. Add a sentence to your Comment thanking Reviewer #1 for his heroic efforts in obtaining the authors' important details and for confirming your calculations.

50. Receive the editor's decision that your Comment could perhaps now be published. Unfortunately, Comments "can be no more than 1.00 pages long, so your Comment cannot be considered further until it is shortened to less than 1.00 pages long."

51. Point out to the editor that most Comments in his journal are two to three pages long. Furthermore, it was the editor himself who suggested lengthening it to three pages in the first place. And Reviewer #1 strongly recommended leaving it that long.

52. Wait a month for a response, during which time, answer questions from numerous friends regarding the fraudulence of your life's work and asking what new field you're considering and reminding you of how lucky you are to still have your job.

53. Turn down a friend's job offer in his brother-in-law's septic-tank pumping company.

54. Obtain the latest issue of the journal and enjoy reading yet another downright lengthy Comment, this one swimming in such extravagant grammatical constructions as dependent clauses.

55. Receive the editor's response, apologizing that, unfortunately, Comments "can be no more than 1.00 pages long, so your Comment cannot be considered further until it is shortened to less than 1.00 pages long."

56. Download pdf files of all Comments published in the journal in the past decade, most of which were three pages long. Send them to the editor, his boss, and his boss's boss.

57. Receive the editor's response, apologizing that, unfortunately, Comments "can be no more than 1.00 pages long, so your Comment cannot be considered further until it is shortened to less than 1.00 pages long."

58. Shorten your Comment to 0.80 pages, again removing gratuitous length-increasing luxuries such as figures, equations, explanations, adjectives, and adverbs. Also again remove your corrections of some of the authors' errors.

59. In addition, replace extravagant words containing wastefully wide letters, such as "m" and "w", with space-saving words containing nice lean letters, like "i", "j", "t", and "l". So what if "global warming" has become "global tilting."

60. Resubmit your Comment.

61. Wait two weeks.

62. Receive a response from the journal, stating that your Comment is 1.09 pages long. Unfortunately, Comments "can be no more than 1.00 pages long, so your Comment cannot be considered further until it is shortened to less than 1.00 pages long."

63. Shorten your Comment by removing such extraneous text as logical arguments.

64. Also, consider kicking off your coauthor from a different institution, whose additional address absorbs an entire line of

valuable Comment space. Wonder why you asked him to help out in the first place.

65. Also, consider performing the necessary legal paperwork to shorten your last name, which could, as is, extend the author list to an excessive two lines.

66. Vow that, in the future, you will collaborate only with scientists with short names (Russians are definitely out).

67. Indeed, thank your Chinese grad-student coauthor for having a last name only two letters long. Make a mental note to include this important fact in recommendations you will someday write to her potential employers.

68. Resubmit your Comment.

69. Wait two weeks.

70. Receive a response from the senior editor (the editor's boss) that you cannot thank Reviewer #1 for obtaining the missing details and confirming your results, as this would reveal that fact that the journal was biased in your favor in the Comment review process.

71. Assure the senior editor that, if anyone even considered asking about this, you would immediately and emphatically confirm under oath, on a stack of Newton's *Principia Mathematica*'s, and under penalty of torture and death that, in this matter, the journal was most definitely not biased in your favor in any way, shape, or form in the current geological epoch or any other and in this universe or any other, whether real or imagined.

72. Receive a response from the senior editor that you cannot thank Reviewer #1 for obtaining the missing details and confirming your results, as this would reveal the fact that the journal was biased in your favor in the Comment review process.

73. Remove mention of Reviewer #1's having obtained the necessary details from the acknowledgment, realizing that it's probably for the best in the end. If word were to get out that, in order to do so, he had managed to infiltrate the allegedly impenetrable ultrahigh-level security of the top-secret United States government nuclear-weapons lab, where it happens that

the authors worked, he would likely be prosecuted by the George W. Bush administration for treason. And if he's anything like the other scientists you know, he probably wouldn't last long in Gitmo.

74. Resubmit your Comment.

75. Wait two weeks.

76. Receive a response from the journal stating that, in your submitted MS Word file, the references are not double-spaced. Although they will be single-spaced when published, your Comment cannot be considered for publication until the references in this document are double-spaced.

77. Add lines between the several references, a process that requires a total of twelve seconds.

78. Resubmit your Comment, a process that, due to the dysfunctional journal web-site's problems, requires a total of three hours.

79. Wait two weeks.

80. Receive a response from the senior editor that, while your Comment is now short enough and properly formatted, over the many modifications and shortenings that have occurred, its tone has become somewhat harsh. For example, a sentence that originally read, "The authors appear to have perhaps accidentally utilized an array size that was somewhat disproportionate for the corresponding and relevant waveform complexity," has evolved into: "The authors are wrong."

81. Have numerous telephone conversations with the senior editor, in which you overwhelm him with the numerous other issues you have had to deal with during the Comment evaluation process until he forgets about your Comment's tone. Indeed, compared to your verbal tone during these telephone calls, the paper's tone seems downright friendly.

82. Celebrate this minor victory by deciding not to include in the final draft of the Comment's Acknowledgments section a description of certain individuals you've encountered during this

process—a description that would have involved such colorful terms as "bonehead" and "cheese-weenie."

83. Wait four months, during which time, respond to numerous close relatives regarding the fraudulence of your life's work and who remind you that at least you still have your health, albeit in a noticeably deteriorating state over the past few months. And perhaps you'd like to join them at the local bar for its daily Happy Hour.

84. Take them up on their offer, but learn that they expect you to pay for drinks, which, regrettably, you can't because sales at the small company you formed to sell devices based on your work have fallen to essentially zero.

85. Learn from one of your grad students that a potential employer asked her, "Hasn't your work recently been discredited?"

86. Learn that she was not granted an interview.

87. Wonder whether your Comment has finally been sent to the authors for their Reply, or instead was lost, trashed, or sent back to the reviewers for further review and possible rejection.

88. Attend a conference, where a colleague informs you that he is Reviewer #1. Attempt to hug him, but be advised that a simple "thank you" for merely doing his job is sufficient.

89. Learn from Reviewer #1 that he has not received the authors' Reply for review, or any other correspondence from the journal in the several months since he submitted his review.

90. Realize that you had stopped carefully reading the journal, and, as a result, had missed the "Erratum" published by the authors on the paper in question six months earlier, shortly after you submitted your short-lived three-page version of the Comment.

91. Note that, in this "Erratum," the authors actually admitted no errors and instead reported new—similarly incorrect—numbers, which they concluded "do not change any conclusions" in their original paper.

92. Feel old, as you can remember the days when Errata involved correcting old errors and not introducing new ones.

93. Note also that, in their "Erratum," the authors have actually responded to some highly specific criticisms of their errors you mentioned in the three-page version of your Comment—criticisms that you had removed when shortening it to meet the journal's strict 1.00-page limit. Criticisms the authors couldn't possibly have known about in view of the journal's strict confidentiality rules for submitted papers, unless this version of your Comment was somehow leaked to them...

94. Realize that, with this "Erratum," the authors have effectively already published their "Reply" to your Comment.

95. Note also that, while your Comment has been kicking around for close to a year, its publication date nowhere in sight, the authors' "Erratum" was published in a mere *nineteen days*.

96. With two mathematical mistakes by the authors to consider now and plenty of time in which to consider them, realize that their main mathematical error was simply to forget to take the square root when computing the "root-mean-square"—a childish mistake.

97. Note that this is consistent with the fact that, on both their paper and "Erratum," one of the authors' names is misspelled. And this is also consistent with the fact that, by now, you've already spent approximately 100 times as much time attempting to correct their errors as they spent making them.

98. Realize that you must now modify your Comment to also include a discussion of the "Erratum." Politely ask the editor if you can do this.

99. Receive a response from the editor that, after much discussion among the journal editors, it has been decided that a special exception will be made for you, in addition to the unusually preferential treatment you've already received, so, yes, you can do this.

100. Include a couple of short sentences debunking the "Erratum" in your Comment, using up two valuable lines of text and three valuable lines in the reference list due to its unnecessarily long title.

101. Realize that your Comment is now several lines longer than the do-or-die 1.00-page limit.

102. Shorten your Comment by omitting noncritical words like "a," "an," and "the," giving Comment exotic foreign feel.

103. Also, take advantage of the fact that, in some literary circles, sentence fragments are considered acceptable. Decide that, indeed, verbs highly over-rated.

104. Declare "death to all commas" a worthless piece of unnecessary punctuation if ever there was one.

105. Consider using txt msg shorthand 4 actual words 2 further shrtn ur Cmnt, but decide not 2 when u realize that the 100s of frowny-face emoticons u couldnt resist also adding actually lengthened it 2 2 pages :(

106. Resubmit your Comment.

107. Realize that modifying your Comment to include the "Erratum" has now, unfortunately, opened it up for additional criticism and delays from the editors and possibly the reviewers.

108. Receive a phone call from the senior editor, who takes advantage of this opportunity. He has suddenly also remembered that your Comment's tone is a bit harsh. He is concerned that the authors of the incorrect paper, who appear to be highly motivated and quite crafty, will complain loudly and aggressively about the obviously preferential treatment your Comment is clearly receiving from the journal and make his life miserable. He objects to nearly every sentence in your Comment, in each case, insisting on a considerably longer sentence. For example, he insists that you not say that the authors are "wrong" and suggests instead "perhaps mistaken." He also insists on replacing the word "so" with its unforgivably long synonym, "therefore."

109. Realize that, if you accede to his demands, your Comment will be an unacceptable 1.2 pages long, dooming it to oblivion.

110. Also learn from the senior editor that you cannot thank Reviewer #1 even for simply "confirming your calculations," as

this would also reveal the obvious preferential treatment your Comment has clearly received from the journal.

111. Explain that thanking a reviewer for performing relevant calculations is a common type of acknowledgment for effort commonly performed by reviewers, revealing no preferential treatment by the journal whatsoever. Send him a copy of a recent paper from his journal in which the authors thank a reviewer for actually *proving several theorems* for them.

112. Learn from the senior editor that another reason that you cannot thank Reviewer #1 is that there is no record of Reviewer #1 actually having confirmed your calculations. Apparently, the paper on which it was printed has, over the eons, turned to dust.

113. Send a copy of the email from the journal containing Reviewer #1's review to the senior editor.

114. Also, offer to put the senior editor in touch with Reviewer #1, in case all records of Reviewer #1's identity have also been lost.

115. In addition, learn from the senior editor that, while he admits no expertise in your field, he will nevertheless not allow you to say in your Comment that the approach that you proved twenty years earlier is "fundamentally impossible" is in fact "fundamentally impossible." Instead, you must say that it "has not been shown to be possible."

116. Realize that, if this could accurately be said about perpetual-motion machines, it would rekindle interest in that long-forgotten field.

117. Receive no response.

118. Realize that this is probably good news.

119. Encounter a journal representative at a conference, who kindly mentions that the one-page version of your Comment was, in fact, sent to the authors for their Reply. And, after a long series of delays, they have submitted it. But, unfortunately, it is extremely contentious and will be rejected unless toned down significantly. It's as if, for some reason, they want it to be rejected.

120. In preparation for the final phase of the Comment process, write to the editor asking if you will be able to see the Reply to your Comment and make minor modifications in view of it, as allowed by most journals.

121. For once, obtain a quick response: "No."

122. Finally receive notice from the editor that the authors' official Reply to your Comment has been reviewed and processed. Unfortunately, it was not found suitable for publication and so was rejected. And because, "for maximum reader enjoyment, it is the policy of this journal that a Comment cannot be published without a corresponding Reply, your Comment cannot be published. This decision is final."

123. Be advised that the journal thanks you for submitting your Comment, and you should feel free to submit a paper on a different subject in the future, as this journal features the most rapid publication of any journal in this field.

Addendum

This ridiculous scenario actually occurred as written; I didn't make it up. Of course, I exaggerated the responses at my end, from competitors, colleagues, friends, relatives, and myself, but *not* those of the journal editors or the authors. Those events all happened exactly as I've described them.

I confess that the fate described in the last two steps actually occurred to a *different* Comment, which I submitted to a different journal a few years earlier, and which, in fact, never was published, precisely for the absurd reason given.

Over a year after submitting the actual Comment discussed in all the other steps, I realized that it was clearly doomed unless I took serious action, so I sent a draft of this story to the senior editor's boss. Shortly afterward, I received a call from the senior editor, who had suddenly withdrawn all of his objections. The Comment was fine as it was, and it would be published!

However, I was still not allowed to see the authors' Reply until it was actually in print. And when it appeared, it reiterated the same erroneous claims and numbers (for the third time!) and then introduced a few new erroneous claims, which, of course, I am not allowed to respond to. So I've run out of options and have simply given up.

Fortunately, however, since its publication, the incorrect paper has only been cited once—by a ruthless competitor, who I suspect was secretly behind much of the unethical behavior reported here.

I've withheld the names of the various individuals in this story because my purpose is not to make accusations (as much as I would like to; they're certainly deserved), but instead to effect some social change. Nearly everyone I've encountered who has written a Comment has found the system to be heavily biased against well-intentioned correcting of errors—often serious ones—in the archival scientific literature. I find this quite disturbing.

And would it have killed these authors to email me their "results" prior to publishing them, so I could've enlightened them before they committed themselves to their errors in print, thus avoiding all this pain? In fact, one of them gave a talk at a conference on this work a few months before the initial paper's publication and was pretty aggressively attacked by the audience in the question-and-answer period after it, so I had assumed that he had realized the error of his ways. Apparently not!

Finally, I should also mention that, to keep this story light and at least somewhat entertaining, I actually *simplified* it somewhat, omitting numerous additional steps involving journal web-site crashes, undelivered emails, unreturned phone calls to dysfunctional pagers, complaints to higher levels of journal management, and some rather disturbing (and decidedly unfunny) behavior by the authors and certain editors.

After all, I wouldn't want to discourage you from submitting a Comment.

Addendum to the Addendum

As scientists, we're accustomed to being right. But occasionally, we're wrong. And occasionally our mistakes find their way into print.

No one likes admitting he's wrong—especially to the entire world and for all time. Everyone agrees that logic dictates owning up to a mistake immediately. But some folks, for reasons of their own, just sit back, admitting no error, in the hope that no one will notice.

Of course, when one erroneously attacks someone's work, it's pretty much guaranteed that that someone will notice. And he who notices is going to—and should be able to—complain in the scientifically appropriate form of a Comment.

Alas, when this happens, the authors of an erroneous paper aren't alone. The journal has made the same mistake in publishing the paper in the first place. And journal editors can be just as neurotic, if not

more so, in hoping that no one will notice. The publication of erroneous results thus creates a natural and unholy alliance between the misguided authors and the perhaps equally misguided editors. Worse, the journal editors have the power to have their way, even to ignore—and deny the existence of—a reviewer who has clearly taken the time to carefully confirm the error, as I have experienced.

This is not the scientific culture that I looked forward to as a youngster.

By the way, this is most emphatically *not* a story of the big guy picking on the little guy. Most scientists in this field consider *me* the big shot, and the authors the little guys writing one of their first papers in this area. So it's not about some sort of scientific class structure.

Nevertheless, that the system allows for this kind of behavior proves that it's clearly badly broken. So, how would I fix it?

1. All data and parameters associated with any open publication should be available to anyone interested in it. The NIH has mandated this for its grant recipients, but sharing data and parameters should also be a required condition for publication in any journal, no matter the funding source. Refusing to do so *after* a paper is published should be considered scientific misconduct.
2. Anyone knowingly publishing a paper that clearly contradicts the work of another group should be required, also as a condition for publication, to attempt to discuss the matter with that group well before publication. In the past, this was considered good scientific etiquette, but gone, apparently, are those days, so a rule is in order.
3. Journal editors should be more aware of referee conflicts of interest. Reviewers should be required to stipulate any conflict of interest in reviewing a paper, even if it's simply that they don't like the authors.
4. No journal editor should be allowed to edit a Comment on a paper that he allowed to be published. This is an obvious, unacceptable conflict of interest, and it's appalling that it's common practice.
5. Comments should not be required to be so short as to prevent them from making sense. I suggest two journal pages, or, better, three. Or how about this radical idea: as long as it takes to make the point.
6. Crazy rules that allow logically offensive situations, like the one that called for rejecting a Comment because the Reply is unpublishable, should be deleted immediately and never

resurrected. And Comments and Replies need not be published together. The Comment should be published as soon as it is accepted, and the Reply as soon as it is. Indeed, a Comment on a Reply is also a good idea, yielding an interesting ongoing dialog that would benefit the community.

7. Reviewers who competently review a Comment should also review the Reply. They're the best qualified, as they're already familiar with the work. At the very least, their reviews should be made available to the Reply reviewers. This would prevent the insane situation that occurred here, in which the highest quality review of the Comment was simply ignored.
8. Reviewers (of any paper) should themselves be reviewable. Currently, reviewers can say whatever they like, and there is no check on them. Authors should be allowed to single out potentially irresponsible reviewers, such as Reviewer #2 in the above scenario, whose review would then be reviewed by another reviewer. Confirmed irresponsible reviewers should then be identified and removed from reviewer databases, which would be shared with other journals. Writing an irresponsible review should be considered a form of scientific misconduct.
9. While removing unethical reviewers would help, improving reviews of ethical ones is also important. Currently there is no compensation of any sort for reviewers and hence no encouragement to do a good job. I believe that reviewers should be paid for their services. People take paid jobs much more seriously than volunteer efforts. Knowing this, social psychologists pay their subjects simply to fill out questionnaires because it yields much higher-quality results. And what could be more important than the accuracy of the archival scientific literature?
10. Finally, let's face it: some journal editors are simply too arrogant or burned out and have lost sight of the goal, which is to publish only truth. Perhaps they could be required to sign a semi-annual statement that they ascribe to this key value as a condition of taking and keeping the job. Avoidance of conflict is no excuse; that is simply part of the job, and if someone's feelings are hurt because his mistake is pointed out to the world in print, so be it. To paraphrase Tom Hanks in the movie, *A League of Their Own*, as in baseball, there's no crying in science. Scientists are big boys and girls, and we should be able to handle admitting that we've made a mistake.

Indeed, persistent disrespect for the truth by an editor should also be considered a form of misconduct.

11. Science is well known to be effectively self-policing in the sense that correct ideas live forever, and incorrect ones eventually die. But, unfortunately, this can be a very slow process, and it doesn't do much for the humans involved and their careers, which can be badly harmed in the process on a much shorter time scale, especially when misconduct is involved. The knowledge that your ideas will only achieve acceptance after your death (or the death of your career) offers little comfort. We could easily remedy this by setting up a competent scientific misconduct commission (I believe that one already exists for medical research), to which one could take misconduct cases in all areas of science. I'm not talking about witch-hunts to prosecute past violators. Instead, I'm thinking in terms of prevention. Just as laws don't really prevent criminals from doing bad things but do prevent good people from becoming criminals, the existence of such a commission would help discourage good scientists from going bad. And, in my opinion, most scientists are very good people, or at least begin their careers that way.
12. Require scientific ethics courses in grad school. Problems like those that I encountered are a proverbial ticking time bomb for science. What if those opposed to taking action against global warming were to make the claim that science shouldn't be believed in this matter because its process is so rife with poor ethics that it can't be trusted?

The following Addenda have been added since the original story went public.

Addendum to the Addendum to the Addendum

Within hours of its posting on the internet, this story went "viral" and found its way onto many web sites and blogs, including those of Harvard economist, Greg Mankiw, and the founder of Craigslist, Craig Newmark. It has been read by over 100,000 people on one site alone (www.scribd.com). And it has elicited thousands of interesting and generally positive comments (which, fortunately, are a lot easier to publish on the internet than mine was in the journal…). So I thought that I should respond to some of them, which I will do here.

Many people commented that I should've done more than simply submitting a Comment to a clearly hostile journal to get the word out.

Of course, I also did all the things that people suggested. My grad student and I gave talks on the subject; we published paragraphs and figures in papers in other journals when we could reasonably fit them in; we emailed and talked it up among other colleagues; and I placed a longer version of the Comment on my Georgia Tech web site and my company web site fairly quickly.

However, in doing so, we risked having the Comment rejected as "not new." Recall that journals also think of themselves (probably inappropriately) as breaking-news sources and so will reject a paper if it's been covered in the press or some other source, even if that source is not another journal. The journal in question is actually the correct place for the Comment; to not publish a Comment there or to allow it to be rejected is tantamount to accepting the incorrect result. And, unfortunately, most other journals in my field don't accept Comments. Finally, I've published scores of papers in the very journal in question (and won a paper-of-the-year award from them a few years ago and more recently won another shortly *after* this story appeared), so I think no one would have imagined that it'd be hostile. And I still don't believe it was hostile to me personally; it was hostile to the *Comment*.

Others commented that only a naive idiot (yeah, you can say what you want on the internet…) would submit a Comment when so few have been published in the past, so I should've expected trouble. But I should point out that the vast majority of scientific papers are mainly correct, and the few mistakes that do leak through are minor and so don't merit Comments, which could also explain the paucity of Comments. The paper on which I commented was so egregiously and completely wrong that it clearly merited a Comment, so it should've been very easy for the journal to realize this, especially when its chosen anonymous reviewer confirmed my team's results fairly early on.

That my story has propagated so far and has elicited so much discussion seems to me to imply that we're apparently all a bit naïve on the subject, and it's great that many who aren't are weighing in to help enlighten the rest of us.

Others wondered why I didn't take advantage of the senior editor's boss earlier. I did. I called and emailed him several times. He's actually a friend of mine, but he claimed to have had limited ability to interfere (perhaps he wanted to distance himself from a potentially contentious thing like a Comment, fearing that I might do something crazy, like write a story about my experience and put it on the internet...).

A few suggested that the story is so far-fetched that I must have made it up. I sympathize with this opinion; the events are indeed

quite unbelievable! But I'm just not creative enough to have made this up, and rest assured that I did not make it up. Also, many have commented on the internet that they've had similar experiences. I wrote it up in an only semi-successful attempt to retain my sanity during the process (among other stress-related symptoms, I still have a pain in the neck that I developed a few months into the process). And, even though I've not named names, it's not too difficult to find the relevant papers (just web-search "Trebino" and "Comment" and take a look at the references in the Comment itself, or go to the scribd.com site, which has summaries of the science involved and the Comment). Also, I've saved all my correspondence in the matter, which I'm happy to share with anyone who is in a position to do something about this problem and who is willing to invest a couple of days reading it all.

Many suggested suing the authors and the journal. I considered this. But I've never sued anyone before, and an attorney assured me that any lawsuit is a major hassle. Also, my scientific colleagues are highly non-litigious, so many would, as a result, likely avoid me, fearing that I might also sue them. Plus, if I sued the journal, I'd be suing my own non-profit professional society, whose funds come from my colleagues', my friends', and my own dues. And it sponsors conferences I attend and enjoy. Paying me damages would likely cause the cancellation of a conference or two. I am still considering suing the authors and their organization (they certainly deserve to be sued; someone did a search and found that they've done the same thing to others).

Overall, in my opinion, most internet commenters had it exactly right; the system is set up to publish a Comment to correct erroneous work that leaks into the literature, and it really should be able to do so, so it's a shame that it has such a difficult time actually doing so.

Addendum to the Addendum to the Addendum to the Addendum

This story eventually found its way to the desk of Margaret Harris, who edits a physics humor page called *Lateral Thoughts* for the British magazine, *Physics World*. She wrote and invited me to write for this page and, in particular, to adapt this story as my first contribution. She added, however, that it "cannot be considered further until it is shortened to less than 1.00 pages long."

Addendum to the Addendum to the Addendum to the Addendum to the Addendum

I speculated in an earlier Addendum that those opposed to taking action to prevent disastrous global warming could use poor scientific ethics to make their case. This in fact occurred! And this story appears to have played a role in causing it. Shortly after this story went viral on the internet, several global-warming deniers wrote to me, expecting that I might be sympathetic to their cause (I'm not) and asking if I'd like to attend a meeting they were planning, coincidentally in my home town, to plan something big (I declined). A couple of months later, they hacked a British climate-research group's emails and claimed precisely what I had feared. "Climategate" dominated the news for several weeks in the fall of 2009.

A couple of years after I wrote this story, I became suspicious of some results by the ruthless competitor I mentioned in the first Addendum (the only one who had cited the clearly incorrect paper as a problem with my work). Breaking my own personal rule to not look too carefully at one's competitors' work, I decided to look a bit more carefully at his. And what I found was that his measurement technique didn't measure what he was claiming it did and instead measured only a well-known notorious artifact, called the "coherent artifact." This was no small mistake, as hundreds of scientists and technologists were using his technique and expecting correct results, but not getting them. So, my students and I wrote a paper on the subject, essentially debunking *his* work.

We submitted it to the very same journal, which, you'll be happy and perhaps a bit surprised to learn, immediately published it.

In addition, due to the importance of this result, we published several more papers on the subject.

There have been no Comments written on any of them.

And they are frequently cited.

Addendum to the Addendum to the Addendum to the Addendum to the Addendum to the Addendum

This story and its addenda have helped to draw attention to possible changes that should be made to the scientific process. Several serious articles in ethics journals have actually cited it and the addenda and have echoed my suggestions. Shortly after its release, the National Science Foundation (NSF) made ethics training mandatory for all graduate students working on NSF grants. I like to think that

this story played a role is this excellent decision. This has sparked mandatory ethics training in many companies as well.

Alas, I confess that most ethics training courses are about financial and social issues, rather than scientific publishing, probably because ethicists know little about the scientific process and their training courses are designed for nonscientists, as well. But progress is progress, and the first step to the solution of a problem is awareness of it.

Other suggestions that I made have also since been implemented.

Acknowledgments and Afterthoughts

This story has been reprinted with permission from Rick Trebino.

I take all the blame for it, but I'd like to thank Jim Sowell for the idea to write a step on emoticons.

Originally, I withheld the identities of all involved, but there were enough inadvertent clues in the story that internet sleuths have made this information public, so, here's the reference if you'd like to read the actual Comment: L. Xu, D. J. Kane, and R. Trebino, "'Amplitude ambiguities in second-harmonic generation frequency-resolved optical gating' by B. Yellampalle, K.Y. Kim, and A. J. Taylor: Comment," Opt. Lett. 34, 2602 (2009).

The other Comment mentioned in the first Addendum, which never was published, was submitted to Phys. Rev. Lett., which actually did have the curious policy described in steps 122 and 123.