Authors comment on authorship commentary

The recent commentary by Philip Wyatt discusses authorship problems with both ideas and data in scientific papers (PHYSICS TODAY, April 2012, page 9). I have some thoughts to add.

Scientific reports and journal publications represent a huge intellectual effort, the final result of an enormous underlying intellectual structure. Among many and various contributors to the research, who should join as coauthors? Those who publish know a great deal about various types of coauthors, be they "courtesy," "ghost," "gift," "honorary," "surprise," or "token."

For years, major professional societies and mainline journals remained conspicuously silent on the subject of authorship guidelines. The American Physical Society, for example, offers only an insubstantial one-sentence statement: "Authorship should be limited to those who have made a significant contribution to the concept, design, execution, or interpretation of the research study." "Significant" joins "interesting" and "important" among the most meaningless, overused descriptors in scientific writing.

In recent years the biomedical community led a large effort to develop and popularize useful authorship guidelines. About 500 biomedical journals, including the more general journal *Science*, adopted guidelines for submitted manuscripts. Called the Vancouver criteria, the guidelines were put together by the International Committee of Medical Journal Editors and contain three principal requirements, paraphrased below.[1]

▶ Coauthors should generate a significant part of the manuscript's intellectual content (there's that word "significant" again).

▶ Coauthors should contribute to the manuscript, either writing the first draft, reviewing it critically, or revising its intellectual content.

▶ Coauthors should review and approve the final manuscript before it goes to the publisher.

To be listed as an author, a person must meet all three of the above criteria. Fundraising, general research-group supervision, data collection, routine calculations, routine help with manuscript preparation, and other efforts are insufficient for authorship. As a biomedical researcher told me, "Holding the door open to bring the mice into the laboratory does not entitle you to coauthorship." With few exceptions, lending samples, other materials, laboratory equipment, and funds fails to qualify the lender for coauthorship. Lending a good idea may justify coauthorship, per the first requirement above. After all, the continued progress of science depends mainly on developing or discovering new ideas or new interrelationships among familiar concepts.

From the above criteria, there follows another guideline:

▶ Coauthors should be able to present and defend the manuscript's content to an audience of their peers.

Some parallels may be made between the modern-day science-paper authorship issue and *renga*, a form of communal linked verse promoted by Basho in 17th-century Japan and by other master poets. A scribe would record the renga session, noting three items: the verse sequence number (1, 2, 3 . . .), the verse (for example, "a morning full moon, no noisy crows"), and the verse's author. During the versing, exceptional contributions received extra recognition, perhaps even from the master poet present. At the session's end, after 36 to 100 verses (linked by strict rules) were recorded, the scribe revealed how many verses came from each participant. A successful renga session required many contributions, from the castle's host, the ladies who played music and served refreshments, the scribe, the audience, and even cooks, groomsmen, and stable boys. But only those who stood and contributed a verse that was accepted into the final intellectual record had their names brushed in charcoal ink onto rice paper.

Reference

1. International Committee of Medical Journal Editors, "Ethical considerations in the conduct and reporting of research: Authorship and contributorship," http://www.icmje.org/ethical_1author.html.

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■ **The April commentary** on multiauthor publications is a timely discussion of an important problem. I, too, am disappointed that most journals have failed to provide clear guidelines about who should be included as an author. My PhD adviser set out a simple test: An author is someone who has made significant intellectual contributions to the research presented in the paper. Today authorship is used in other ways, perhaps to get technical assistance from another lab or to garner larger visibility for the paper by recruiting a prominent scientist as a coauthor.

As author Philip Wyatt notes, the journal *Science* requires an unpublished statement of the contribution that each author has made to the paper. The journal has also published a thoughtful editorial[1] on the issue of authorship. *Nature*'s policy is a bit more aggressive, in that a statement of author contributions is published with each paper. This approach trades on our innate desire to do the right thing, at least while in public. I have already adopted this approach for papers that I coauthor, and I encourage others to do so.

Let me end with one word of caution about Wyatt's analysis. Yes, it is useful to compare our current practices with those used in the past. But past practices were not necessarily fairer or better. A good example is the oil-drop experiments published by Robert Millikan in 1913 (see PHYSICS TODAY, May 2007, page 56, and reference 2). Harvey Fletcher did a significant amount of the lab work for those experiments as part of his PhD with Millikan. Under current practice, the paper would certainly have included Fletcher as a coauthor and perhaps as first author as well. If the work had been published that way, then Millikan may have had to share his

1923 Nobel Prize in Physics with Fletcher.

References

1. B. Alberts, *Science* **327**, 12 (2010).
2. See *APS News*, August/September 2006, p. 2.

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■ **Philip Wyatt's commentary** on authorship was quite interesting. I help to maintain the authorship lists for two large collaborations in particle physics. I have three comments that may be of interest:

▶ High-energy physics collaborations have authorship rules that may conflict with the guidelines of the journals, and most authors may not be able to defend the conclusions in the paper. *Physical Review Letters* states "Authorship should be limited to those who have made a significant contribution to the concept, design, execution or interpretation of the research study. . . . Other individuals who have contributed to the study should be acknowledged, but not identified as authors" (http:// www.aps.org/policy/statements/02_2.cfm).

▶ Remarkably, I am in a field where people have not, on average, read a majority of their own papers.

▶ I have no realistic solution.

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■ **The commentary by Philip Wyatt** presented intriguing data confirming the evolution of increasingly multiple authorship. It prompts speculations on the social psychology of science. During five decades as a university professor, I experienced that evolution, both in the authorship of astrophysics and planetary-science papers and in research modes used by our graduate students.

Throughout my career I strove to create new physics ideas, in contrast to new data or calculations. Those single-author publications primarily involved seeking new interpretations of phenomena, and by virtue of being original they did not lend themselves to multiple authorship. My large number of single-author papers seems out of step today.

I observe that my single-author papers are not as heavily cited as my multiple-author works, and that my single-author papers are often uncited even by researchers that use the ideas from them. I suggest that the evolution to multiple authorship occurred in part