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Editorial: Successful Letters

6-8 minutes

Physicists borrowed the word “quark” from *Finnegans Wake*, but James Joyce had no obvious connection to physics. Writers do not necessarily study the sciences, although many do, if their work calls for it. However, all scientists, including physicists, must know how to write. With results in hand, physicists must take an additional step and communicate these results to others.

One hundred years ago, physicists were few and funding for physics was largely private. The writing style was formal, without personal pronouns and in the passive voice. It emphasized facts and played down evidence that people were involved in research. Data were taken or calculations undertaken, analyses were performed, discoveries were made, and science advanced. As the number of physicists grew, and funding for physics came more often from public sources, it became increasingly important for physicists to convey their findings to other physicists and to the public. Recently, the medium changed from paper to pdf, but the need to communicate remains, because physics becomes more specialized and competition from other disciplines for public funding grows. Thus it is worthwhile to consider the elements that enable a paper to get its ideas across to other physicists and other scientists, to science writers in the press, and to public servants. What makes a successful Letter?

A successful Letter of course begins with a valid result, one that is important and interesting. This is glib, however, because it lacks explanations of “important” and “interesting.” So, here are attempts to define each, in single sentences: An important result provides insight that changes the way others view and understand the topic, allows them to improve their own approaches, and thus leads to substantial progress. An interesting result will make readers glad to learn of it, because it is important to their own work or the work of others, or because it is science of uncommon beauty, aesthetically. In the context of a manuscript there is a third element: accessibility. Regardless of its content, a manuscript will be of lesser interest if it is impenetrable, and a manuscript that attracts fewer readers will be less important.

Present PRL policy incorporates these three concepts by seeking to publish work that should not be missed by researchers in the

given field and also those in at least some related fields. Broader interest, in general, is better, as is greater importance, but the two are not independent. Work that is extremely important to a few might be as worthy as work that is moderately important to many, which again leads directly to presentation. A manuscript that can be understood only by a narrow audience will be less likely to be suitable for PRL, because it will lose its chance to be moderately important to a wide audience.

Physicists often explain their love of research on the basis of the excitement of discovery, but in writing they may revert to the older, formal style described above. When this style meets the volume of information common in present day research, the result can be difficult to read, not to mention understand. It is of course important that a manuscript present sufficient detail to make it convincing, and authors are motivated to include detail because it shows their hard work and thoroughness. They assume this will convince referees, and editors, that a paper should be published.

It is easy, however, to include too much information. Referees and editors do not differ from other readers: all prefer interesting and digestible manuscripts. Inclusion of too much detail may lead to unfavorable reviews, via the following logic: "A Letter must be accessible. This manuscript is dense and impenetrable. It is therefore not a Letter." To avoid this, authors must make hard choices about what information to include and what to omit. Which pieces are crucial to the discussion, and which are not needed to keep the main message intact? It is counterproductive for authors to leave this sorting as an exercise for referees and other readers. Finally, authors should consider the possibility that the level of information necessary to convey a particular result may be more than will fit in a four-page Letter.

So, once authors determine the minimum amount of information required to communicate their message, what style should they use to communicate it? Part of the answer is straightforward: expository prose, which is simple and direct, with a minimum of adjectives and adverbs. In addition, a readable manuscript should have a logical structure similar to that in any narrative. A short story, for example, sets the scene and the characters, presents conflict, provides a resolution, and ends with an epilog. These same elements make up a well-constructed scientific article. It also should be an interesting narrative, although the terminology is different. To set the scene, a scientific narrative begins with an introduction, to explain where the field stands at present. Conflict appears in the form of an unsolved problem, and resolution as the solution to the problem: the result. The epilog becomes the summary, which discusses the meaning of the result, to give readers some idea of its repercussions.

It is interesting that contributors may adhere to a dense, impersonal style in their manuscripts, but have no difficulty using another style elsewhere. Cover letters that accompany initial submittals may contain descriptions of the results, including context and potential impact, that are clearer than those in the manuscript itself. In fact, some manuscripts include no plain explanation of why the work is of interest. Author responses to negative referee reports sometimes contain narratives reminiscent of short stories (perhaps by Kafka, with particular emphasis on description of conflict). This sometimes makes for interesting reading for us editors, but does not necessarily further the cause of publication.

My hope is that the above provides some useful hints about how to tackle the difficult task of presenting inherently detailed information in an accessible style within the limited space of a Letter. The most important requirements are (1) to include only the necessary information and (2) to organize it in a smooth narrative. This editorial represents my perhaps poor attempt to meet both of these requirements. The issue of sentence-level construction is less critical, and it will not surprise me if some writers still take comfort in the passive-voice style described above. Frankly, this comfort is a mystery to me.