Current Dilemmas
Why I Publish — The Research Chemist.

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Introduction

Research scientists in industry come from academic backgrounds and, like their colleagues in tertiary education, they participate in professional affairs through their learned societies. As a consequence their reasons for publishing are often similar to those of academics. In this article I propose to review briefly our reasons for publication and to draw attention to some trends in publication that are a cause for concern.

Why do we publish?

Scientists publish for a variety of reasons related to their professional, personal and institutional needs.

At a purely professional level we publish to announce the results of our work to our colleagues and to add to the body of knowledge on which we all draw. Science is not recognised unless it is published according to certain standards. Until then it is merely an anecdotal report. Scientific quality control requires that the work is sufficiently well described to allow others to confirm its veracity and that the work is refereed by anonymous experts before release.

Scientists are usually cautious about findings published in unrefereed journals, in abstracts and short communications without an experimental section or quoted in articles as unpublished observations or personal communications.

On a personal level we publish to stake our claim as inventors or original thinkers so as to enhance our scientific reputations. This can lead to invitations to be a referee, to be an examiner of theses, a book reviewer, a conference speaker or an officer of a learned society. Within a company or university the development of one's scientific reputation could be critical in determining promotion or in influencing an application for a new post.

Publication is of value too at a corporate level. In industry we wish to attract bright young scientists as recruits by demonstrating that high quality science is being undertaken. Moreover the opportunity to participate fully in the scientific community is appreciated by existing staff and contributes to their motivation. As in the case of the individual scientist, publication gives a company a measure of independent quality review.

Many individual scientists have joint projects with university colleagues involving research students or postdoctoral fellows. Publication is then an essential part of academic collaborations and scientific public relations. In the development of new medicines there is a critical stage when the company discusses the treatment with clinical specialists in hospitals and medical schools. At this point, company researchers and physicians wish to obtain the help of medical specialists in evaluating the use of the new medicine firstly in volunteers and later in patients. This process is facilitated if the industrial scientists can point to quality publications already accepted by respected journals describing the work undertaken so far on the medicine in the company's own laboratories.

Quality Considerations

For publications to serve properly our personal, professional and corporate needs it is implicit that they should be of a high quality. This means that they should describe clearly worthwhile studies well performed. The work should be based upon a novel idea or the investigation of new observations. The study must be carefully designed to ensure that valid conclusions can be reached. The authors must use and describe methods suitable for the nature of the investigation and present clear and precise results. Finally the authors should reach conclusions that make a worthwhile addition to the field. Publication in a journal with a good reputation for using high standards in refereeing gives the less expert reader some confidence that the work has been subjected to detailed examination before publication.

It is true that many publications fail to meet these exacting standards. The work may be repetitive or a trivial variation on earlier studies. Commonly publication is fragmented by numerous short communications which lack details of the methods

used. Moreover one often finds that the conclusions drawn are ambiguous and leave the reader frustrated to find his time wasted. There are at least 10 million organic compounds known and any one of these injected at a suitable dose into a rat would produce some kind of effect. To publish such observations would be facile. However a scientist with a biochemical hypothesis about some aspect of physiology or pathology might be able to design an experiment involving the administration of a few novel substances to animals that would add significantly to medical research.

Factors in Low Quality

Low quality publications arise for several reasons. Firstly scientists wish to claim credit for their work before they are overtaken by competitors. This can lead to the fragmentation of work in short communications. Since the first version usually lacks full experimental details a further and fuller paper is required to satisfy other workers in the field. This does not always appear and when it does it inevitably leads to a degree of duplication.

Sometimes scientists find that they can obtain funds to attend a meeting only if they have a paper to deliver or a poster to present. It is commonplace that graduate students are required to make one or more presentations as part of their doctorate. Both of these factors lead to large numbers of short communications that are published in abstract form.

It is not uncommon to find that scientists have to furnish for graduation, recruitment, promotion, tenure or funding, evidence of scientific achievement through their list of publications. The scientific merit of the papers may be assessed only by an expert in the field or perhaps estimated retrospectively by citation counting. The inexperienced reader is likely to be impressed by the number of publications and this factor provides a pressure to issue part works.

Conclusion

While scientific publication continues to provide the benefits for which it was designed in disseminating information it has become inefficient and cumbersome because of the plethora of trivial communications. The factors that drive fragmentation and duplication are connected with the personal needs of the authors rather with than the information needs of the readers. ❑