SOME ASPECTS OF EDITING FOR MATERIALS SCIENCE

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ABSTRACT

'Editing' covers a wide variety of activities, some of which are of central importance for the progress of science. In my article, I examine a few of these as they concern the science of materials, on the basis of personal experience.

The most important function is that of editing a journal devoted to accounts of original research, or else a journal that publishes review papers. In the first instance, the editor sits at the centre of a web, awaiting submissions like a spider waiting for flies to arrive.
Unlike a spider, he gets help from referees who advise him. One of the most difficult aspects of being an editor is to get the relation with referees just right, neither paying them too much attention nor insufficient attention. Editing a review journal is different: here the editor has to identify and persuade an expert to give the accumulated benefit of his expertise to his professional colleagues around the world... but referees are still necessary.

When it comes to edited (multiauthor) books, including encyclopedias, the editor's job is rather like that of the editor of a review journal. My experience of performing this task has taught me many lessons. The most important lesson is that it is dangerous to believe promises.

Other kinds of editor work in publishing houses and usually they are not professional scientists; they do anything from ensuring the right typeface to arranging contracts, and one of the journal editor's skills lies in getting along with publisher's editors.

Finally, there are editors who organize, and sometimes themselves write, reviews of scientific books. This is an extremely important function which is suffering from increasing neglect, and I say something about this also.

Journals

The publication of scientific research is in crisis. Libraries cannot afford to subscribe to all the journals that they need, publishers in turn are faced by a subscriber rebellion, authors have a choice between traditional journals (many of

which levy substantial page charges) and on-line electronic journals which also can be expensive for authors. In the middle of the confrontation between those who have results to communicate to the world, and those who control the means of doing so... there sit the editors, the decision-makers who are supposed to guarantee quality. Without editors, the system would soon come to a complete halt, because the journals, printed or electronic, would quickly fill up with junk.

As I say, editors are supposed to guarantee quality. How do they learn to do that? There are no training courses for scientific editors – and even fulltime newspaper editors have to learn by doing, and sometimes they do not learn very well, as we in Britain have recently rediscovered with one of the big London newspapers. The only way to become a competent scientific editor, I believe, is through love for good science, and the willingness to devote much time and attention to the cultivation of good science.

In the rest of this memoir of editorial evolution, I base myself on personal experience. I have been a scientific editor for 46 years: I was thrown in at the deep end in 1958, with the instruction to create a Journal of Nuclear Materials (JNM) for North-Holland Publishers. I was given no guidance, but I did know something about nuclear materials. Today, 46 years later, I know a lot about editing and not quite as much as I once did about nuclear materials! The journal is still flourishing and authors from the CNEA in Buenos Aires have played a distinct role in its success.

Much more recently, in 1992, I began work on a brand new journal entitled Intermetallics, which is about as specialised as it is possible to be; I guided it through its first 10 years, until I became too tired to carry on with this responsibility. Such highly specialised titles are at some risk of becoming so narrow that they cease to be commercially viable; this is what happened to Nanostructured Materials, a journal which lasted about 7 years and then was closed by its publisher; the field became highly fashionable a little later, but that was too late to save the journal.

The big divide in journals in our field, materials science and technology, is between specialised journals like JNM and 'broad-spectrum' journals such as Journal of Materials Science (JMS), which I also founded, this time in 1965. A broad journal seeks to include between its covers as wide a selection of topics as it can. The lesson of experience here is that for such a journal to be really comprehensive, it is necessary for it to be created de novo as a broad journal, and it also helps if from the beginning it has several editors qualified to cover different kinds of topics. Attempts to convert a metallurgical journal into a broad materials journal do not work well: such journals are apt to remain metallurgical in spite of all attempts to transform them. (Even that very distinguished journal, Acta Metallurgica, when it was converted into Acta Materialia, has found it quite difficult to become broader). Another lesson that I have learnt is that a broad journal, after a while, is likely to develop some degree of bias, in the sense that authors are increasingly likely to focus on certain topics. Thus, one of the most successful of broad journals, the Journal of Materials Research (MRS), has developed

increasing focus on processing of materials. I am not suggesting that the editors encourage such a focus; instead, it seems to happen spontaneously. Another way in which broad journals can develop is for them to split, after some years, into separate, more specialised titles. This is what has happened with Materials Science and Engineering. True balanced breadth is very difficult to sustain.

There are only a few broad review journals in Materials Science Engineering, but they are very important for the health of our discipline. Progress in Materials Science began in 1949 as Progress in Metal Physics; it made the change from the older title after only a few years, so that it was not yet firmly perceived by the research community as being wholly committed to metals. One of the problems that such journals encounter is that many universities (and other employers) are snobbish about review articles and do not value them as much, when considering promotions, as they value research papers. And yet, outstanding review papers fulfil a crucial function in scientific research, because they separate out the outstanding from the second-rate among research papers. The value judgments and summarising skills of outstanding reviewers deserve the highest commendation!

Editors need their referees as Don Quijote needed Sancho Panza, to keep sufficient contact with reality. I am not suggesting that referees come riding on donkeys, though just a few of them do turn out to be donkeys, especially those who focus fiercely on some very minor, inessential portion of a scientific paper. I have learnt over the years to attend closely to what my chosen referees tell me, but to treat them as advisers, not as dictators. (A metallurgical editor, many years ago, in my own country was a retired military man who knew no science, and he had to do exactly what his referees told him. In any case, it is hard to see how he could have made a sensible choice of referees.

Editors need to know the subject which they are editing!). Another thing I have learnt is to act as my own referee for those topics where my expertise is good enough. This might cause dismay in the minds of a few scientists who have developed the undesirable habit of dividing their lists of publications into the categories "refereed" and "unrefereed", since journals with editors like myself might be regarded as falling halfway between those categories!

Books

Over the years, I have been involved with edited (multiauthor) books, series of such books, and individual books which I have written myself. The one which has been most difficult but also, I believe, the most useful is the one called Physical Metallurgy, which has passed through 4 editions, the last in 3 volumes with almost 3000 pages. I have told the history of that mammoth enterprise in a recent article in Progress in Metal Physics. During the 1990s, I was involved as an editor -in-chief with a big series of multiauthor books covering, more or less, the whole of materials science and technology. The decisions to undertake these ventures on a multiauthor basis were inevitable, since the range of knowledge

required was so huge that single-author books would not have been feasible at the level of sophistication which we intended. It is always a slight pity when multiauthor books have to be assembled and single-author ventures have to be avoided, because multiauthor books are usually an editorial nightmare. Authors so often don't keep their promises, and working with 2 levels of editing (series editors commissioning editors of individual volumes) leads to further problems with volume editors who sometimes don't keep their promises either. But when the job is done at last, one forgets the heartache en route!

Certainly, the reception given to the successive editions of Physical Metallurgy have justified all the endless hard work required of the editors (Peter Haasen and myself).

Another form of multiauthor work is an encyclopedia, and I have a good deal of experience in editing these also. The most recent work with which I have been involved is the Encyclopedia of Materials: Science and Technology, published in 2001 and since then regularly updated with new articles which appear on the internet only. This, I am sure, is the way of the future! Here again there are sometimes 2 levels of editing with all the problems that this mode entails, but again, the end-result is worthwhile. As I write this, I have just finished assembling the second edition of a Concise Enyclopedia of Materials Characterization (first edition 1993), which seems to fulfil a definite need.

The single-author books that I have written really do not belong in this short article, which is about editors. They include a book on the history of materials science (The Coming of Materials Science, 2001), another (Artifice and Artefacts, 1992) which is a collection of short scientific articles which I wrote for Nature over a period of many years, and an autobiography (Dislocations, 2005) which is nearly ready to go to the publisher. They may also be hard work but are also much easier to produce than multiauthor works.

Book Reviews

My final category here is a form of writing which is falling out of fashion... critical reviews of scientific books. I have long believed such reviews to be an essential service to our profession, because in their absence the professional community often has no idea about recently published books and even if they have, they cannot know which ones are particularly worth reading. When one considers the prices of scientific monographs in 2004, mistaken choices here can be very expensive. Over the years I have written more than a hundred such reviews, as well as acting as a collector (i.e., editor) of reviews, for instance, for the MRS Bulletin. In this second capacity, I have gradually learnt what skills are necessary to write book reviews: they are rather similar to the skills needed by referees of scientific papers; the most crucial skill is a good sense of proportion... that is, a good balance in the judgment of the different aspects of a book.

There is a further reason why the generation of critical book reviews is important: publishers will lose the incentive to print such books if sales are too small. For most kinds of scientific monograph, sales of a few hundred copies are regarded as quite respectable. If a book is not made known, sales can drop to around 200, and that means a heavy loss for the publisher, because there is a limit - even in 2004 - to how high the selling price can be set. Textbooks and research monographs are an indispensable part of the world of scientific publishing - indispensable for the readers - and so readers must do their part, through the practice of critical reviewing, to keep that part of the publishing world alive.

Further Reading

1. Editing the Refereed Scientific Journal: Practical, Political and Ethical Issues, edited by Robert A. Weeks and Donald L. Kinser. (Proceedings of a conference held in 1992). IEEE Press, New York, 1994 (ISBN 0-7803-1027-6). This includes an article by Robert W. Cahn, Referees: Advisers or Deciders?, page 34.

2. The Birth and Evolution of Physical Metallurgy, by Robert W. Cahn, in Progress in Materials Science 49/3 (2004), page 221.

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