Current Dilemmas
Why I Publish — A Learned Society.

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The Chemical Society - direct ancestor of the Royal Society of Chemistry (the RSC) - was founded in 1841. In 1842 it began publishing and its royal charter, awarded in 1848, contained the words:

> "... by holding meetings at stated periods at which new discoveries have been brought under discussion and the results made known to the public in a series of transactions from time to time published by the said Society..."
>
> "... distinguished individuals in foreign countries have availed themselves of the facilities offered by the same Society for communicating important scientific and practical discoveries made abroad and that thus a useful interchange of valuable information has been affected..."

So the members of the Chemical Society clearly saw, from the beginning, that one of its major responsibilities was to assure the publication of chemical research. In this it was continuing a practice, by then almost two centuries old, by which natural philosophers (the term scientist was not introduced until 1840) reported on their investigations or their theories in journals for the interest, enlightenment and critical scrutiny of their fellows.

Newton himself claimed that if he had seen further than other men it was because he stood on the shoulders of giants. Even the more modest efforts of those nineteenth century chemists who founded the Chemical Society depended on what had gone before and they knew that the development of the subject would require systematic, authoritative and critically evaluated dissemination of the results of their research. By this process too would reputations be made, and lost, end priority established.

A quotation from an editorial published in the journal Science in 1963 describes the process well.

> "Part of the strength of science is that it has tended to attract individuals who love knowledge and the creation of it. Just as important to the integrity of science have been the unwritten rules of the game. These provide recognition and approbation for work which is imaginative and accurate, and apathy or criticism for the trivial or inaccurate ... Thus, it is the communication process which is at the core of the vitality and integrity of science ... The system of rewards and punishments tends to make honest, vigorous, conscientious, hard-working scholars out of people who have human tendencies of slothfulness and no more rectitude than the law requires."

In essence that procedure, orders of magnitude greater in size, continues today - still essentially in the same medium. And the 1981 Charter of the RSC gives the "dissemination of chemical knowledge" as the first aim of the Society. So a quick answer to "Why do I publish" would be: "We've always done so and two charters have said we should!" The publication of research in some form or other is essential for the progress of science.

But this ignores another powerful role of publication; a role which was unimportant in 1842. Today the world's chemical and pharmaceutical industries - and others - continuously monitor the literature for the ideas and results that fuel their search for innovation and competitive advantage. So even if primary publishing is in essentially the same form as in 1842 its quantity and importance has required the creation of new and sophisticated systems of abstracting and retrieval to ensure that what has been published can be retrieved and is not hopelessly hidden in the mass of literature in our libraries.

These secondary, abstracting, services that began to be developed a century or so ago have burgeoned with the growth of the literature. The means of storage of, and access to, information have become increasingly sophisticated. The learned societies, for example the American Chemical Society, Institute of Electrical Engineers, and Society for Analytical Chemistry were often the instigators of

these abstract services and as their skills have developed so have their products.

The RSC's secondary products have two roots, one, the long collaboration between the Chemical Society/RSC and the American Chemical Society and, two, the abstracting skills developed in the creation of Analytical Abstracts. Now we cover Analytical Chemistry, Chemical Hazards, Agrochemicals, Chemical Business, Chemical Engineering, Mass Spectrometry, Nutrition - and we plan to do more.

Like other learned and professional bodies the RSC takes its publishing activities seriously, investing time and effort in preserving their quality and developing them. It publishes both for its original purposes and for the modern needs of the scientist today - in industry or academic life - for abstracts and reviews. In all we employ nearly 200 people directly in publishing, with probably 20 or 30 others indirectly working for that aspect of the Society. That doesn't include the fifty or more senior members of the Society active on editorial boards and the many hundreds who serve as referees.

The original single primary journal of 1841 has spawned:

- more primary journals — printed and
- rapid communications journals — online
- abstracts
  - printed
  - online
  - floppy disc
- databanks
  - printed
  - online
  - floppy disc
  - CD ROM
- reviews
  - books
  - periodicals
- monographs end text books
- wall charts
- videos

We publish all these with the aim of serving the international community of chemists in both academic and industrial research but we measure our success by a financial return; we no longer publish what we believe chemists want and then subsidise it from our members' subscriptions. Indeed the position is quite the opposite. We attempt properly to assess the requirements of our markets and we design and amend our products to meet these requirements. The surplus then earned by our publishing goes to support the "professional" activities of the society. Learned societies learnt from the commercial publishers what assets they had and how they might be exploited.

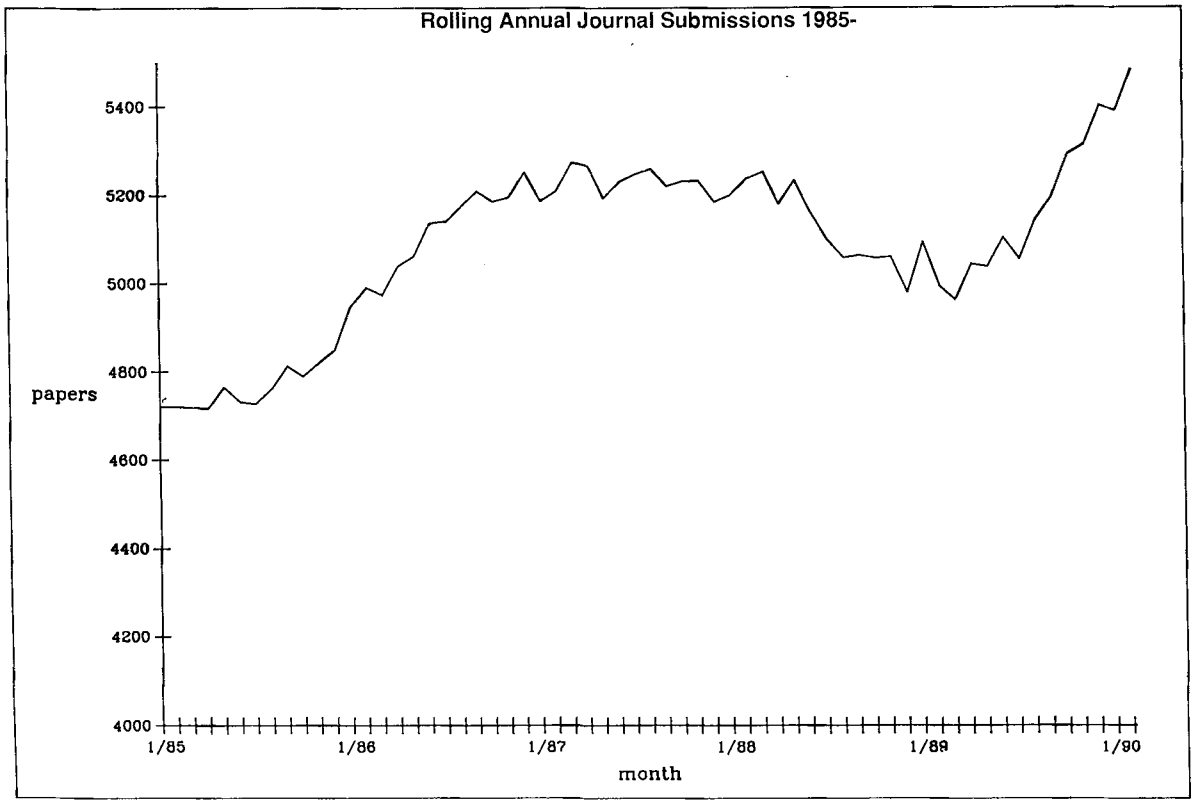
But perhaps I am answering in too naive a way the question you asked me to address. Perhaps you really meant: Why do you publish so much? or perhaps: Why do you publish so much and charge so much for it?

My answer to those questions may, I hope, be informative because a learned Society tends to be reactive in its publishing; its decision-making is not generally adventurous and it can be expected to have interests beyond the purely commercial. You have come to expect that commercial publishers will continually produce new books and serials and it is tempting to conclude that in some way such publishers are themselves the cause of the flow of information material which threatens to drown you.

But the RSC has only published one new primary journal in the last decade yet you can see that, neglecting the dip caused by our office relocation from London, even for us the moving annual rate of receipt of papers has increased since 1985 from 4,700 to 5,500, rising particularly strongly in 1989 (See Figure 1). Ignoring the 1989 figure - the consequence again of relocation - the number of pages published each year has risen steadily too (and in this case we have statistics for a longer period). (See Figure 2)

But we know that there are major areas of chemistry for which we are no longer the obvious place of publication; specialist journals have been started elsewhere and have drained away from us papers in their areas. The position is in fact quite straightforward: there are more chemists than ever before and their productivity is greater than ever before. Compare the time a literature search using CAS online takes with one using a "printed" route and reflect that similar advances have occurred in many other aspects of the chemist's work - it would be odd if the amount published *hadn't* increased enormously. The RSC hasn't really responded to this increase, it has generally left the foundation of new specialist journals to the commercial publishers, it has lost papers thereby. For sizeable areas of chemistry our journals are no longer the place of choice of publication. But still we have more papers sent to us. We have tried to be more selective; rejection rates have increased. More

FIGURE 1



— Figure 1 —

papers come from abroad (over 70%) - many from authors with English as a second language. Greater selectivity and more editing both increase our costs; gradually declining subscription numbers require these enhanced costs to be covered by fewer purchasers. We have made - and continue to make - production economies but even so our price rises generally have to exceed inflation.

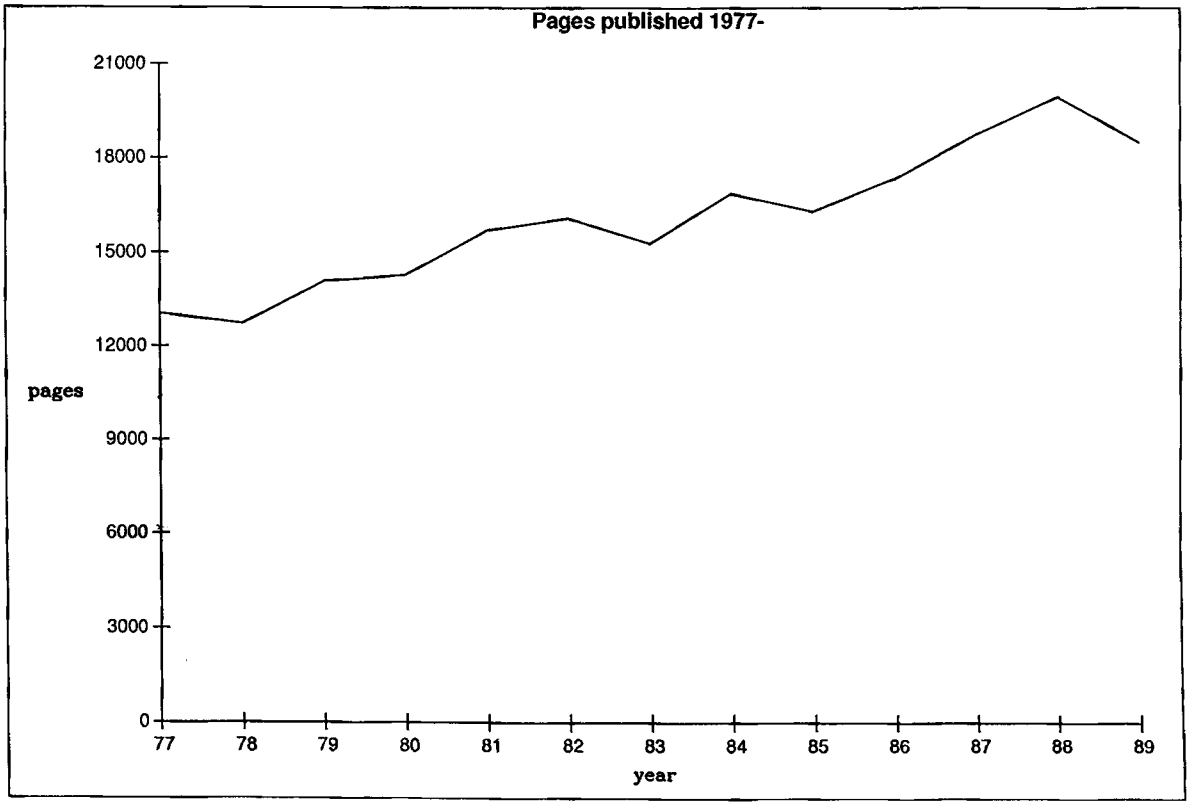
Presumably then you would change the question again: Why do you continue publishing in this way?

In the seventies when that question was asked - and it was as relevant then - most of the sorts of people usually asked to give talks like this would have said, in effect: "don't worry we're not going to, the printed journal of research is a thing of the past. By the mid- to late eighties scientists will announce their results electronically; a sort of international electronic bulletin board in each subject will be developed." To question that vision was to put oneself with the stage coach owners and the cavalrymen. Publishers put their money where their mouths were and, in most cases, lost it; luckily for most of them their "printed" profits increased and helped pay for their electronic errors.

However dangerous it may be to say it, the existing system still works. Reports of its death are premature; I am not even sure that it is terminally ill. It has developed so as to cope with the enormous growth in what is published. Those who publish and those who seek specific published information are both, perhaps imperfectly, but certainly adequately, served. Science and its application proceed at an increasing pace. There is much choice in where you may publish; there is less, but by no means little, choice in the means of retrieving information. Much effort goes into attempts to improve what we have; much effort goes into proposals for radical change. I can't forecast what will be the shape of the information transfer system in future years. The users, the scientists, will determine it through the pressures they can, collectively, impose.

But I dare to suggest that a number of requirements, some psychological, some technological, are satisfied by the present system of printed journals and electronic abstracts and that these requirements must also apply to any system which is expected to replace the present one.

FIGURE 2



— Figure 2 —

1. The system must contain, and be seen to contain, peer-group refereeing - critical validation of what it contains.
2. By some means a contribution must be seen to be published. No-one wishes to place their work in a giant electronic database from which it may never be recalled. Reputation, further funding, promotion, all requires a positive act of publication; at present this is best achieved in a learned journal of quality with high refereeing standards.
3. The technology by which a contribution is accessed and read must be straightforward, flexible and universal.
4. The primary publication must be recorded in Chemical Abstracts or similar databases in other areas so that retrieval is effective. The primary paper itself must be written with that retrieval in mind.

For primary work in electronic form at present only the first of these is available - and that is because the service available contains the text of the published, refereed, journals; it is an offshoot of the printed journal not a replacement for it.

So I believe that, for the time being at least, you - and we - have to make the best we can of the situation. We shall try to improve the sieving process, to increase the quality of what is published. You, as librarians, must act as one of the agents of natural selection by cancelling your subscriptions to the third-rate and second-rate journals.

So, briefly to summarise, we publish because that is an essential part of the development of knowledge and we publish as we do because that seems to meet the needs of our users and we shall increasingly use new technology so long as it can help us to meet those needs. ❑