

THE FIFTH K PRATHAP MEMORIAL LECTURE

THE EVOLUTION OF MEDICAL JOURNALS

S.P. LOCK, MA, MD, FRCP

*Editor, British Medical Journal*

The fifth K. Prathap Memorial Lecture was delivered by Dr. Stephen P. Lock to the Malaysian Society of Pathologists on 11 November 1989. The main text of the Lecture is reproduced here.

You as information scientists will be well aware of the saying "information explosion". I suspect that you may even use it yourself, particularly when you realise that now there are probably about 100,000 scientific journals, some 20-25,000 of them biomedical - of which 15,000 or more are "serious" publications. And yet this so-called "explosion" is an illusion; the rate of expansion since the beginning of serious publication in 1665 has been a constant 5-7% a year. There are, of course, many more scientists around than there ever have been, and there's a cogent suggestion that the proportion of the number of journals to the number of scientists is constant. This was borne out by some research by Dr Edward Huth, the editor of the *Annals of Internal Medicine*, who took two undoubtedly accurate figures over the past 30 years: the number of journals received by the National Library of Medicine, in Bethesda, Maryland, and the number of registered physicians in the USA. He found that there was a constant ratio of 17 journals per 1,000 physicians and that this hadn't changed over the past 30 years.

So we have to ask ourselves why there is this pattern. The answer can be found, I think, in the way that scientific disciplines evolve. Solla Price's rule of thumb is that a scientist who publishes one article every year can take in the contents of more than one other paper a month, but less than one article a day. This leads to a few hundred individuals keeping each other in business. Now a few hundred is the same size as the membership of the early scientific societies, and of today's invisible colleges.

Disciplines tend to split every 10 years or so, and the new subdisciplines do not necessarily correspond with the organisational and professional structures. These are much more rigid and slower to change than the way in which the pattern of new knowledge changes. These structures will include journals, and thus there is constantly a real need for new journals which will reflect the needs of the new subdisciplines. In this way a specialist journal will be formed to take some of the work which has become too complex for the

general journal - and the general journal may truly have been under tremendous pressure for space and unable to publish even all the first-rate material submitted to it. But in time even the specialist journal is seen as too rigid or unable to cope with all the articles, and so the need for another, superspecialist journal arises. A typical pattern might be: *Philosophical Transactions of the Royal Society*, *BMJ*, *Gut*, *Journal of Gastrointestinal Endoscopy*, *Pancreas*.

In this way you get a hierarchy of journals - which as you can see is now in five tiers. But these journals aren't static and their content changes with the needs of the readership and the philosophies of the times. Take my own journal, for example, the *British Medical Journal*. At one time this covered all fields, principally with original articles and a few editorials. Then increasing specialisation meant that a number of separate disciplines set up their own journals. Now the load of specialist articles with very little general appeal could be diverted away from the general journal. But then the readers of the general journal wanted to be kept in touch with important developments in all the specialties, and to have them explained and put into the context of accepted practice. So general journals started to publish many more review articles, editorials, and other forms of comment in an attempt to keep this fragmented corpus of general medicine together.

I can best illustrate this by asking you to look at two covers of *British Medical Journals* at an interval of 37 years. In 1951 we had mostly original articles, case reports, and letters to the editor; today we have 8 pages of leading articles and a regular review; 6 pages of a new style of News presentation, with informed expert comment on developments; a Medical Practice section of 18 pages, including an ABC of transfusion and an article on new drugs; a large correspondence section, almost entirely devoted to comment on previously published articles, and so on.

This process of generalisation is now also happening to special journals in the first tier:

these are now becoming *general* journals of their discipline. I have already mentioned paediatrics – which is now not only a large specialty but also a very wide one. The paediatric geneticist needs to keep up with paediatric orthopaedics and paediatric endocrinology – otherwise he is lost, and so may be his patients. For this reason we get the first tier paediatric journal displacing some of the articles submitted to it to the second tier journal and filling the space with editorials, review articles, personal practice and so on. A good comparison can be made by looking at two issues of the *Archives of Diseases in Childhood* at 31 years distance – which illustrate what I have said.

What I didn't point out to you in comparing the two issues of the *BMJ* and of the *Archives* is that there hasn't been much of a reduction in the number of original papers published. This is an apparent paradox but it comes about by the professionalisation of the editor and his activities, and of course the authors and the readers have approved. The editor has introduced peer review if this didn't exist before or made it more stringent with guidelines and so on if peer review did exist. He has started paying attention to the important aspects of statistics – say, the design or the analysis of a clinical trial. And finally he has started subediting the manuscript to be published – not just housestyling but cutting and reshaping the account so that it can be read with ease, by both native readers of that language and others whose language is different. And the result has of course been shorter and more lucid articles.

All this can come about because obviously journals are big business and the revenue from subscriptions and advertisements can pay for this kind of professionalisation. But it has also come about for a philosophical reason. Let's go back to the invisible college, which forms a new discipline, which then needs its own journal. At this stage the readership of the journal is the same as the authorship – small groups of workers are writing for each other. Later on, when the discipline has expanded, the situation is different: readers are now in the majority; they don't necessarily understand every article any more, and so they need articles to be clear, relevant and accurate.

Hence the editor now has to change his emphasis to the needs of the reader, and this means the new structure of the journal and the new process of editing which I've described.

Although he's usually a part time worker, the editor also becomes professionalised, and soon he forms clubs and groups, which then discuss problems and produce guidelines and codes. Many groups have been formed in the past few years – and there is a long list of topics which the association of full-time editors, the so-called Vancouver group, has discussed, often producing documents about them. It would be a brave person who would predict what we shall all be discussing in another 10 years' time, let alone 30 years' time, but I would suggest that the ownership of intellectual property and the demands of the new media will be among them. The computer in its widest sense is likely to play a very major part. I need only instance the new development of the structured abstract and suggest how easily this system would translate to the CD ROM. This abstract could be printed in a journal and the complete article with the full data soon put on to a CD ROM. Finally also I believe that the new technology can solve some new problems. A lot of new information is now not being published formally at all, but topics such as peptide sequences and structures of genes are being circulated as preprints or on telephone conversations. Couldn't all this new information be harnessed with electronic databases, which everybody could access. In fact this would constitute a new tier of journal – a sixth tier – and it would be novel in that librarians and information scientists would almost certainly be responsible for collating it, and in providing access to it. Of course, we shall go on needing the printed word; I cannot ever see the societal role of many printed journals ever being abolished. These convey all sorts of information, not just original work, and we all recognise the vital role of browsing and eavesdropping in the generation of scientific ideas. So I see an exciting future of a mixture of the new and the old, which is surely how all of us would want it.