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Communicating science: the role of Academies*

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What is science? Science is all about the things we would like to know more about, the whys and wherefores, and about presenting theories and hypothesis to peers, decision makers and others. The science of communication is no exception. As new scientific ground is broken and knowledge of the world we live in increases, complex moral and ethical issues arise that society and government do not always have the know how to address. Where can and should scholarly societies position themselves on these issues, and what role can schorarly publishing play? The answers are neither obvious nor simple.

There is a growing need in society to ensure that the best scientific knowledge available is effectively communicated to as many people as possible. However, the research findings are not always easy to explain or to understand, even among scientists themselves. Academies of Science are among the most important contributors to scholarship and scholarly publication—The Royal Swedish Academy of Sciences itself publishes seven scholarly journals. This gives academies a unique position from which they could guide change in current publication strategies.

Have we become better at communicating science than previously? Who can guarantee that important research is comunicated effectively; the researcher, the research institution, learned societies? The questions are numerous and are growing in number as the options open to researchers increase.

Only a very brief examination of the current situation in scholarly communication/publishing will show that the positions of commercial publishers and scholarly societies are changing. The dynamics involved in this change can occasionally take a form resembling a very dramatic sports match with the players vying for the best positions in order to make the best score for the team. In the prevailing situation, several of the large commercial publishing houses are offering "deals" that could be advantageous to learned society publishers, and many learned societies have opted for these offers in order to avoid investments in the new technologies and to ensure adequate marketing of their journals. Most learned publishers lack the manpower and know-how to market effectively, which is something commercial publishers have long experience in.

However, is the scenario that has been created by the new technologies, providing a situation whereby future scholarly communication systems can be built solely around the research itself and the institutions, organizations, corporations and societies in which the research is carried out? Are we witnessing a situation where scientists and scholars are determined to rein-

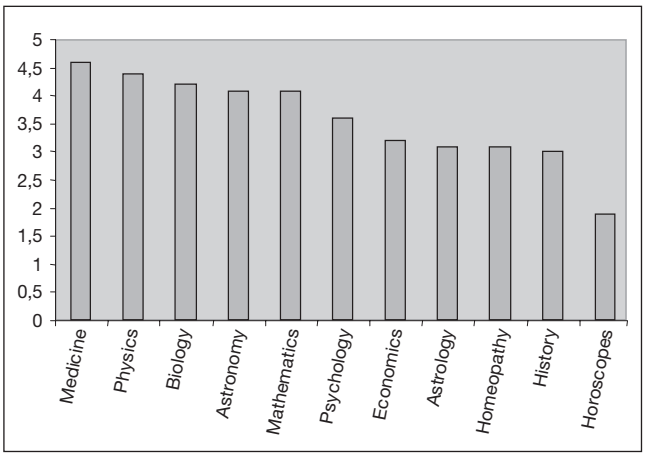

Figure 1. What Europeans see as scientific. Average view of the Europeans (EU-25) on a five-point scale, including both Astrology and Horoscopes. The latter is alone in failing to obtain 50%. Anything that exceeds four points is considered to be "highly scientific".

* Based on the Lecture given by the author at the Institute for Catalan Studies, Barcelona, on 10 May 2006.

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state themselves as the main players, not "payers", in the communication of science? Hopefully, the answers to this question will be supplied by the writers and readers of research themselves as they continue to make demands on rapid publication and broad dissemination.

Research Communication for What, by Whom, and to Whom?

Science communication is something academia has always invested in, but the investments are becoming increasingly expensive for the researcher and the academic community as a whole. What is being done to halt these trends? Quite a lot, and across a broad range of organiztions.

The social lives of everyone are being influenced by the rapid increase in scientific and technological development and by the enormous quantity of information being produced in the process. If, as estimates have shown, our knowledge base doubles every 5-10 years, who should be trusted with the dissemination of this knowledge and to whom? There is more or less consensus within the scientific community itself on the issue of the dissemination of knowledge and on the means of dissemination. Most scientists insist that research findings should be made readily available to the science comunity across all scientific borders. They would probably also agree that the information also needs to filter down in understandable form to decision makers and the general public in order to increase in value. However, most scientists are engaged 100% in research and have seldom the time or economic means to become completely active in exploring new publication strategies.

It can be argued that in this relatively new communication landscape, many learned societies have become increasingly aware of the importance of their role in creating common ground between the research itself and how the results of this research are communicated rapidly, efficiently, and at as low cost as possible. There is a growing understanding of the new means that have become available with the advent of the Internet. The same is true for universities, institutions and their researchers, and even involved governments. What is also true, however, is that the changing dynamic landscape of opportunities provided by the web can both complicate and simplify the roles of all the players. A landscape is now available where scientists can interact directly and in real time, wherever they are

World Seience Forum – Budapest, 2005

Final Recommendations

Due to the complexity of science today, the relationship between academia, government, the business sector, and other actors in society needs to be recast. This process in turn demands new models for science funding, education and communication;

To fully benefit from the opportunities of capacity building, experiences and good practices should be exchanged and should be shared worldwide;

It is essential to foster mutual understanding to bridge the cultural gap between science and business, with particular attention paid to interconnectedness, interdependence, ethics and human values;

The rapidly widening gap in capacity, scientific knowledge and achievements in science and technology among different countries and regions should be eliminated by strengthening South-South and South-North cooperation;

Intrinsic ecological values should be recognized, including the greater community of life with which we share the planet, and need to maintain the evolutionary potential of life itself,

It is never too early to interest children in science-and once enthused they will become a new generation with a crucially improved understanding of science.

Figure 2. Final recommendations of the World Science Forum, Budapest, 2005.

in the world. It is obvious that the scientific community in increasingly availing itself of this opportunity and will continue to do so at gathering speed. Is this forwarded movement too fast?

Commercial publishers have long been well aware of the implications of this new publishing landscape and see that their role as the major disseminators of research findings is being challenged, if not yet threatened. Many commercial publishing houses are seeking new ways to attract both the writer and reader of science by developing and providing new publication strategies and economic incentives to among others, libraries, and learned society publishers. Journals published by learned societies are increasingly attractive to the commercial publisher because they often, by the very existence of an established and trusted brand name, continue to be seen as non-profit publications by the market.

Learned Societies as Communicators of Science

Interdisciplinary research is of increasing importance in knowledge-based societies. Learned societies constitute unique meeting places for scientists, often cutting across broad disciplinary borders. Some of the world's most brilliant minds are grouped together within academies at national and international levels. These groups of scientists are in a position to link together historical and current scientific findings and to form new hypotheses and theories based on the knowledge generated. The question today, however is whether or not academies have or should have obligations and responsibilities to academia as a whole on the issue of scholarly publishing, and what these responsibilities and obligations should be. As new communication technologies develop, including new alternatives to current forms of communicating science, such as online commentary, reader reviews, threaded discussions, blogs even, should academies become new actors in the communication of science field or should they simply wait and see what direction current deliberations take?

As mentioned previously, many academies of science already publish scientific documents, books and/or journals either independently or through commercial publishing houses. Scientists today would probably argue that scholarly publishing needs to be kept more tightly reined within academia, and that the authors of research and research results should control the dissemination of the information generated. Indeed, the web offers scholars and learned societies tremendous opportunities to "regain" control of the publishing of science. But, as mentioned previously, do learned societies want to become more involved and to add this "extra" burden to their other obligations or should this be something that is solved by the scientists at the individual and institutional levels? There is no answer to this question, simply because other players are entering the field and continually changing the landscape. Google Science is one example.

For many years, scientists have been "mistrustful" of commercial publishers. They see the publisher making huge economic gains that do not directly benefit the scientific community. However, as research findings must be documented and made available in the academic and public arena, the researcher is looking for new ways to achieve this goal at as low cost as

Academies could take a more proactive role in:

providing guidance to ensure that science is free to explore and to challenge accepted views and concepts;

forwarding development in education, research and technological innovation relating to communication;

providing help to strengthen effective data sharing across scientific borders;

helping pinpoint ongoing changes in the scientific arena, and effective dissemination of these findings;

helping to establish trust in the scientific information communicated;

having elder scientists act as mentors with the requisite skills to provide advice to younger colleagues on publication issues;

building up writing and publication confidence among young scientists.

Figure 3. Some of the issues academies of science could address.

possible. New partnerhips are being formed between those who have information that needs to be disseminated and those who are interested in conveying this information at low cost.

What appears to be changing the scenario today is that new IT and printing products are actively being marketed and used to guide researchers, learned societies, and commercial publishing houses along completely different routes; routes that seem to entail more direct publishing "power" to the individual researcher and the scientific community and less to the commercial publisher. Is there a common ground for a development that is of mutual benefit to all parties?

In this rapidly changing science-publishing scene any "business as usual" model is out of the question. In the new era of S&T publishing exciting new communication opportunites now exist for researchers and publishers alike. The science publishing market is dynamic and extremely mobile, and developments within this market need to reflect the interests of all of those involved in its development including learned societies. In the process of change ahead, tolerance, patience and flexibility will be needed to allow space for the many divergent approaches to best practices in science communication.

The challenges to science and to scientists are complex, but because mankind is facing a future that will require effective and sometimes drastic steps to ensure sustainable international development, our own well-being, as well as that of future generations, the right to an effective and economically viable dissemination of knowledge must not be jeopardized or sacrificed on the alter of economic gain.

The goal of science is to provide reliable information about developments in research for the benefit of all mankind. We should be guided by this knowledge, whatever our individual roles in the future of its dissemination.