The following is the text of a keynote speech given at the APE2011 conference in Berlin, January 11, 2011 by Jos Engelen

Ladies and Gentlemen,

It is an honor and a pleasure for me to address you today on the subject of scientific publishing. ‘What can academic publishing, what can academic publishers do for science?’, that is my subject today. Scientific publishing is an absolutely essential part of scientific research. Not just because scientific publications are a record of what has been achieved, but also, and even more importantly, because these publications are a source of knowledge for new research and therefore indispensable for the advancement of science.

Let me say it from the outset: I consider the business of publishing a professional activity that requires specific expertise. In particular ‘quality assurance’ and ‘quality control’ of the publications should be guaranteed through a well defined and transparent process. I will come back to this.
In addition Academic Publishers are of course also essential for enabling access to results and for allowing to creatively use these results, for allowing ‘discovering’ them. This will be of growing importance because we have not even begun yet to fully exploit the possibilities modern ICT offers.

Quality assurance en quality control. Allow me to entertain you with a little anecdote. Last December an article was published in 'Science' that drew quite a bit of attention. The title was: '***A Bacterium That Can Grow by Using Arsenic Instead of Phosphorus'.*** Quite spectacular: a new element had been added to the traditional six elements that are known to be the building blocks of life! In fact I read about this publication in a regular newspaper. My Institute in Amsterdam has a subscription to the 'electronic' version of Science. But to my disappointment I could not get access to the paper, because it had been published in Science Express and my Institute had not paid the additional fee of 825 dollars that would have granted me access to the publication. Obviously for the publisher of Science Magazine and Science Express scientific papers are a commercial business, for really 'hot' papers you pay extra, but does this not go too far? What is the value added by the publisher that would justify this additional fee? I cannot think of one. Perhaps it is the exceptional quality and relevance of this paper? Certainly not in this case. As it turned out, the claim the authors lay in the title is not substantiated in the paper. The scientific community considers this a bad paper, premature at best.

Let me add a second anecdote. When I wrote my Ph.D. thesis, in the seventies (of the 20th century), one of the chapters was based on an article that I had published in a journal called Nuclear Physics B. In return for having the paper reviewed and

published, I had given away the copyright, as was customary. I was advised to ask permission of the publisher before reproducing the paper in my thesis. Let me give you the title of this paper too: ***'A Study of Non-Charge-Exchange K^0(bar)π^- Production in the Reaction K^-p--> K^0(bar)π^-p at 4.2 GeV/c'.*** Not as spectacular as the title above, but still: I asked permission and of course it was granted. Now, why did I do that? Not because I was legally obliged to. I could not care less (at that time...) No, it was because an external party had put a value on my research and on my results and because it had, independently, assured the quality of my results. Asking and getting the permission was a reconfirmation of all this, and this made me feel proud. It was important to me as a young scientist.

And that, ladies and gentlemen, is the essence of scientific publishing: the quality of the research and the results that are published should be guaranteed. Usually this is done under the responsibility of an editor-in-chief and an editorial board and with the help of a well organized peer review system. Although this is perfectly obvious to this audience the importance of it cannot be overstated. For scientific publishing all other considerations, certainly those of a commercial nature, should be second to those concerning quality.

You could be thinking: why ask permission to reproduce an article you wrote yourself? Or even more in general: why pay a subscription fee to get access to articles that are based on

publicly funded research? Should not these articles be in the public domain? Yes, I think they should. But I am aware that these articles cannot be made available for free. Publishing is not for amateurs and volunteers. Professional Academic publishers have been absolutely essential for creating and developing the top quality journals that we have and need. However: the ‘business model’ for scientific publishing should be changed: from ‘subscription fee based’ to ‘author pays’. This is the best way to optimize the flow of knowledge. In principle changing the business model is straightforward. The cost of publishing, including peer reviewing, distribution, archiving etc. should be determined and agreed. It could be expressed, for example, as a cost per page, or a cost per article. This cost should then be borne by the research grant of the author or the authors. This operation is cost neutral for the public funds that are involved: they merely shift from ‘library budget’ to ‘research budget’. Simple as it may be in principle, as hard it is in practice. Why is this so?

First and primarily because the established publishers are not automatically motivated to change their business model. Some of them are willing to look into it, but certainly not all of them. I can understand that, why change a profitable business model? It is somewhat harder to understand, by the way, why non-profit organizations in the publishing business should be reluctant to change. For example: the American Association for

the Advancement of Science, the publisher of Science Magazine and Science Express.

I am addressing you as a scientist and as the president of a national research funding organization. What can we do, what can the scientific community do, to promote and accelerate the transition to Open Access publishing? Because that is what I am discussing here: Open Access publishing.
Indeed, what Academic Publishing can do for science is to adopt Open Access (while continuing to give the quality assurance mentioned earlier, and deploy technologies to improve access and ‘discovery’).

Open Access publishing has been eased enormously by the advent of the WorldWide Web. In principle the Open Access model is independent of the technology of course, but in practice it received an enormous boost through the availability of ‘web based’ publishing. So, again: what can we do to accelerate the transition to Open Access publishing? Obviously, we will have to accept that during a transition period both publishing models, the classical one and the open access one, will coexist, for a while. In my opinion, the research funding organizations should start to provide authors with funds for publication, while at the same time the libraries still pay subscription fees. For a while. In the field of Particle Physics the so-called SCOAP3 consortium has successfully organized a large number of funding agencies, labs and libraries in a concerted

action to promote Open Access publishing in high energy physics.

My own organization, the Netherlands Organisation for Scientific Research, makes funds available for publications according to the ‘author pays’ (or ‘consortium pays’) model. But the number of eligible journals, across all fields of science, is still rather limited and although the NWO fund is used, there is no rush on it. The main barrier quoted by many scientists for OA publishing was found out by a recent rather large-scale survey of a project called SOAP. The facts are that 90% of surveyed scientists (more than 40.000 answered the survey) think that OA is beneficial, but only 8-10% of articles today are published OA. Asked why they do not publish OA, 40% of scientists say the problem is funding. And 30% say it is quality.

There are examples of successful OA initiatives.

BioMed Central and PLoS started OA journals which became of very high quality, and often even in fields where there were no journals or no high-quality journals. This makes a virtuous circle: there are good journals, scientists aspire to publish there, making them even better, schemes like NWO’s allow fees to be met, and the journals can thrive.

In the applications to the NWO Incentive Fund on Open Access PLoS and Biomed Central (BMC) are mentioned most often.

But also fairly many other titles are mentioned, and I consider that very promising. (For example: ‘Atmospheric Chemistry and Physics’;’Climates of the Past’.)

What seems to me an ideal way forward would be, first, the conversion of the existing and well established journals to the new, the Open Access, model. Journals of commercial and ’not for profit’ publishers alike. Some publishers, by the way, make commendable steps towards Open Access by offering it as a choice besides the classical model. And although these steps are much appreciated, to my taste it does not go far enough.

Second, if the conversion of existing, high quality journals remains insufficiently successful, initiatives should be taken to start more new journals according to the Open Access model. Examples in the humanities can be given by NWO in February 2011 after a pilot round has been finished assessing about 20 applications for new Open Access journals in the humanities. Setting up a new journal ‘from scratch’ is not to be thought of lightly. It is a full time occupation for a number of persons and if these are ‘volunteers’ initially, at a certain point the new journal will have to be run by a professional staff, embedded in a professional organization if it is to be ‘sustainable’.

In order to help initiatives for starting new Open Access journals my organization, NWO, also makes funds available to support such initiatives through the initial phase. After an initial

period these journals then should be able to stand on their own feet, of course. Although setting up a new journal is difficult enough, there is another hurdle to overcome for such a journal to survive, a hurdle of our own making. If I say our own making I mean us: the scientific community, the funding organizations. And the hurdle I refer to is the so called impact factor. This ‘impact factor’ is a measure of the quality, of the importance of a journal: as you know it measures the average number of citations the journal receives per published article. In judging the past performance of researchers, and in assessing the potential of their grant applications, their publications and the impact factors of the journals those publications appeared in, are taken into account. The impact factor of any new journal, so also of new Open Access journals, is by definition zero. Therefore, scientists are reluctant to submit their articles to journals that are not yet established. In order to break out of this vicious circle we should use our imagination. I myself have appealed to senior researchers in the Netherlands with an established high reputation, to set an example and submit their work to Open Access journals, even if the impact factor of these journals is not yet high. With their help this impact factor would certainly grow in no time. I do not have the illusion, however, that my appeal will receive massive positive response... Therefore I would like to make another suggestion. Why don’t we assign an initial, ‘artificial’ impact factor to new Open Access journals. This impact factor could be based on the impact factor of journals covering a similar field,

having a similar editorial system etc. It could be based on the reputation of the members of the editorial board. After two or three years this initial impact factor could then be replaced by the real one, or even sooner should the real impact factor grow successfully. In any case: as I said earlier, NWO has made some funds available to help new initiatives through the initial phase, until they are self-supporting.
For most scientists I know, Open Access publishing is not as important as publishing ‘as such’ in established journals with a good reputation. This is partly due to the impact-factor that I mentioned just now, but certainly also because scientists are not yet familiar with the subject. Therefore I have recently suggested that scientific conferences include a session of a couple of hours to Open Access. There, an overview of the existing Open Access journals relevant for the specific field of that conference could be given and, if necessary or desirable, new initiatives could be started. NWO has announced that conferences can apply for funds in order to specifically sponsor the inclusion of a session on Open Access in the program.

Although in this talk I mainly focus on Open Access publishing in scientific journals, the issue is equally relevant for books. Open Access to academic books (or monographs) is a relatively new idea. Access to books is currently fragmented and limited. Books are not widely available online and the average circulation of printed books has dropped considerably over the past decades. The sustainability of traditional monograph

publishing is under threat, and there are a number of initiatives, such as OAPEN here in Europe - to develop an Open Access model for books.

With this in mind, we decided to include monographs in our Open Access policies. NWO established an Incentive Fund for both Open Access journal articles and Open Access books resulting from NWO projects. And we are also taking part in a pilot project with OAPEN, to fund 50 Open Access books in the next two years, in order to gain experience with this new form of book publishing and collect data on the effects of Open Access on the impact of books.

What are the reasons for the scientific community, including the funding organizations, to insist so strongly on the importance of Open Access publishing?

There are several. There are reasons of cost. Let me repeat again that we realize this cost cannot be reduced to zero, that is not realistic and that is not the intention of my plea. Scientific publishing is *not* just putting your articles on the Web, I stated that earlier. Yet, in the 'author pays' model, it is certainly easier to control costs and, indeed, some subscription fees have risen to astronomical heights during the last decade or so. Let me illustrate this by a third (and last!) anecdote. A few days ago I had a meeting with the research director of a medium sized company specialized in producing and improving

plant seeds. This company is successful in providing high quality and innovative products and maintains a large R&D department; in fact the company spends 15% of its turn-over on R&D. The researchers have a large interest in the scientific literature in their field. But the company noticed that the subscription fees for a sufficiently large spectrum of journals have become uncomfortably large. The company requested they join the collective contract the Dutch universities have with the publishers, but the publishers turned them down. But now the company has found a solution: a few of their R&D workers have enrolled at a university and in this way they, and their colleagues of course, have access to the university libraries and subscriptions. In a knowledge based economy knowledge should flow freely!

Beside the reasons of cost, we have a further reason for supporting Open Access: the advancement of science itself. A comprehensive, quality-controlled body of scientific results, combined with new web-based search tools, should allow researchers to advance knowledge across the world and across disciplinary boundaries. There is a large potential for innovative ‘tools’ here: humans cannot read 1.5 million articles per year, ‘machines’ can.

Ladies and gentlemen, it is time for me to conclude. An important underlying theme of my talk this morning was that scientific research is a necessary ingredient for a knowledge-

based society, including a knowledge-based economy and its growth. A professional publication process is indispensable for the dissemination of knowledge and the advancement of knowledge through further, innovative scientific research. These goals of scientific publishing are best reached in an Open Access publishing business model. In my judgment it is essential that Open Access becomes the standard and does not remain the exception. For publicly funded research Open Access publishing should become a requirement. In order to make Open Access publishing a success, the enthusiastic cooperation of the professional publishing companies active on the scientific market is highly desirable. But I would like to conclude with stating my firm conviction that Open Access publishing will be the future standard, sooner or later!

Thank you for your attention.