

Open peer review, open access and a House of Commons report

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Abstract: This paper discusses the ‘academic spring’ in terms of two parts: the changes towards Open Access and the changes from traditional Peer Review towards a system of Open Peer Review. The openness of the latter is seen in terms of two characteristics: no anonymity of either authors or reviewers; and inclusivity: i.e. the potential involvement of many reviewers from different communities and paradigmatic views. The discussion and critical analysis is developed in the context of a discussion of the traditional Peer Review system of research evaluation. In doing so the paper reviews the Report on Peer Review by the UK House of Commons Select Committee on Science and Technology. The analysis leads to a consideration of economics in the context of Open Access and Open Peer Review, as well as to an analysis of problems of the latter system.

Key Words: Peer review; Research evaluation; Open access; Open peer review; House of Commons Science and Technology Committee; Scientific publications; Dissemination and publication of research.

1. Introduction

It has been hailed in the media as an ‘academic spring’. The world mathematics community has been uniting around a call for the boycott of powerful publishers (The Sunday Times, 2012; <http://thecostofknowledge.com/>). Harvard University is encouraging its academics to find alternative dissemination channels to the very expensive traditional ones (The Guardian, 2012a). The British Minister for Universities and Science wrote about a ‘seismic change’ and is planning policies towards the establishment of national digital repositories (The Guardian, 2012b).

What is it all about? Access to the results of research and its funding; this is what it is about. Currently, universities throughout the world pay twice for their staff research. First they pay academics to develop their research whose results are later published in academic journals. Then their libraries pay the publishers hefty sums in order to acquire the journals needed by their researchers to do their scientific work.

This business model is quite profitable for the big international publishers but presents many serious flaws for the research community and for society. First, because it is very expensive for taxpayers and other funders of universities. Second, because it is very inefficient owing to duplication of expense for journals on the part of the university community. Third, the system is highly undemocratic and discriminatory. Researchers who do not belong to a university or other research institutions (such as retired academics) cannot easily access published works. Moreover, the scientific work of researchers in developing countries is made extremely difficult by the prohibitive cost of access to publications that their institutions cannot afford. This last element represents a loss not only for academics in poorer countries but for the world research community: potential different perspectives on scientific issues, specific to different communities and traditions, are lost. In other words a potential source of pluralism in science is lost or greatly undermined. This is particularly problematic for the social sciences in

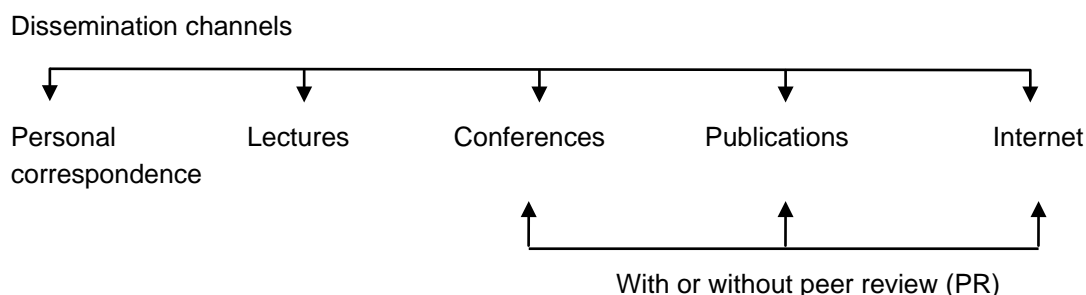
¹ I would like to thank the following people for reading earlier drafts and offering useful comments: Nabyla Daidj, Edward Fullbrook, Donald Gillies, Emily Grosholz, John Latsis and Carlo Milana.

general and economics in particular where the loss of pluralism in theory and policies is costing the economy and society very dearly.

Thus we cannot but welcome the move towards *Open Access* to the results of research. I also hope that these pronouncements by academics, their institutions and a Minister in charge of them in the UK will herald the beginning of both a national and global spring. However, we should also note that this spring, important though it is, is only part of what is going on and only the beginning of what is needed in terms of potential revolution in scientific research: it relates to the dissemination part of research. The other part – no less important – is a revolution in the *validation side* of research results. The two parts are closely interconnected and a full spring will not come to the research community till the blooms in both parts are further advanced.

Let us now explore more closely these two parts of a possible ‘academic spring’ by considering some phases in the life of research. We start with the phase of research that Open Access is concerned about: the dissemination phase. Once a piece of research is completed and written up, the next important step in its life is its dissemination within the research community and beyond it to the wider society. Dissemination is very important for the development of research and knowledge in general because: (a) it allows the community to criticize it; (b) it allows other researchers to build on it and develop it further; and (c) in some cases it allows the technologists, business and wider society to develop - and or use - it for practical purposes.

Figure 1 The dissemination of research results



Dissemination takes various avenues whose relevance has been changing throughout the history of science in correspondence with changes in the technologies and costs of communication and transportation as well as with the change in the size of research communities. Researchers can disseminate their work through (Fig. 1): direct correspondence with fellow researchers; lectures and seminars; conferences; publication in journals and/or books; and increasingly via the internet. Nowadays all these dissemination mediums are used by researchers. However, in the history of science we have witnessed the dominance of different mediums and a shift in their relative importance. In the seventeenth century Newton and his fellow scientists in Europe were disseminating their results mainly via correspondence and exchange of manuscripts: publication was possible though costly and the research community was small. Publication in journals and books acquired prominence in the XIX and

XX century though dissemination via lectures² and conferences were also relevant. The latter medium – conferences – has acquired more importance after WWII with the improvement in the technology of transportation and the decrease in its cost.

In the last 30 years the digital technologies have brought to prominence a new dissemination medium: the internet. Its appeal is enormous because of low or zero costs and speed of dissemination. Moreover, the internet is seen as the most democratic medium of dissemination because anyone with access to a computer can put their works in the public domain. A paper can be widely disseminated before - or without ever - being published in a journal. Increasingly this is what academics do³.

This profusion of dissemination mediums raises the issue of what – if anything – is special about hardcopy publication. From the point of view of the scientific community as a whole, hardcopy publication has advantages over personal correspondence, lectures and conferences⁴: the dissemination process can extend wider in space and time. However, from the point of view of the efficiency and effectiveness of dissemination, hardcopy publication is an inferior medium compared to the internet: it is much more expensive. Moreover, because of its cost, it discriminates against research communities in poor countries who cannot afford its journals and books.

But dissemination is only one of the functions of publications. An additional, very important function is '*quality assurance*': the research community and the wider society believe that when a piece of research is published by a reputable publisher in a journal or book, this certifies the 'good quality' of the work. This belief is connected with the peer review process. Thus it can be claimed that, though the dissemination function can be taken over by country or international digital repositories, the traditional publishing companies still have a major role in delivering well edited papers and, particularly, in securing quality assurance for the published works.

Peer review (PR) systems have been used for decades if not centuries to check the quality of scientific works. However, dissatisfaction with the system has been lingering on for a long time and it has accelerated more recently. As in the case of criticisms of the main existing dissemination method, the current dissatisfaction with the traditional peer review (TRP) system is connected with the fact that there is now a way out. The digital technologies are making possible alternatives to both systems: i.e. moves towards open access (OA) in dissemination and towards open peer review (OPR) systems in quality assurance are now possible because of the digital technologies. It is an indication of wider concerns over the PR system that the House of Commons Select Committee on Science and Technology (2011) has seen the need to conduct an Inquiry into the process and issued a lengthy report⁵. A

² It is interesting to note that the mathematician Andrew Wiles chose to reveal that he had proved Fermat's last theorem at the end of a series of lectures (on 23d June 1993) given at the Isaac Newton Institute in Cambridge.

³ This is what Harvard University is inviting its researchers to do in order to cut down library expenses.

⁴ I here refer to conferences whose proceedings are not published; if they are, then the characteristics of publications would apply.

⁵ In the US an extensive Report (Harley and Acord, 2011) was developed at the UC Berkeley's Centre for Studies in Higher Education on 'The Future of Scholarly Communication Project' funded by the A. W. Mellon Foundation.

review of the Report will be conducted in this article in the course of an analysis of the wider issues around peer review systems in quality assurance.

This article continues in the next section with a presentation of the Report. Section three and four are devoted to an analysis of the traditional peer review (TPR) system and the main criticisms of it. Section five presents an alternative system of peer review: the Open Peer Review (OPR) system. Section six discusses the position of economics in the context of OA, TRP and OPR. The last section concludes.

2. The report: methodology and scope

In January 2011 the Committee invited evidence on Peer Review (PR). After receiving written submissions the Committee took oral evidence and later issued the Report⁶. Peer review (PR) processes can be used in a variety of academic activities from applications for grants to application for jobs and promotion, to book proposals, to papers submitted for conferences, and to papers submitted to journals. The Report deals with the last of these.

The Report consists of seven chapters⁷ the first of which sets the scene by stating that 'Peer review is no more and no less than review by experts' and its primary function is seen by one witness as improving 'the process and the coherence of scientific knowledge and its utility'(p.5). The second chapter discusses the peer review process; the common criticisms of the system; and innovations in peer review listed as: pre-print-servers, open peer review process and online repository journals.

Chapter three discusses the role of editors, authors and reviewers in the peer review process. It includes issues of training and other support systems for editors and reviewers as well as the possible burden of work on reviewers and editors. Chapter four deals with data management including evidence on the reviewing process. Chapter five considers post-publication review and commentaries. Chapter six deals with publication ethics and – given the topic – it has a wider scope than just peer review. However, the review process comes into the ethics debate partly in terms of assessing the ability of the process to detect unethical behaviour.

The Report is based on the written and oral evidence of experts. There were 96 written submissions by self-selected individuals⁸ and institutions: some people wrote in an individual capacity, others as representatives of institutions, be these universities or Government or publishers or journals. The Committee then invited oral evidence from a subset of these people, all of whom were in position of responsibility/authority within institutions. The Committee appointed a specialist adviser for the inquiry. There is evidence that the Report was written largely but not exclusively on the basis of the oral evidence. Views present in written-only submissions are cited here and there.

⁶ The web site published also two responses to the Report: one by the Government and one by the Research Council UK (RCUK).

⁷ At the end of the Report additional information is published on the following: 'Formal minutes'; List of abbreviations'; Witnesses; List of printed written evidence; List of additional written evidence; List of Reports from the Committee during the current Parliament.

⁸ I do not know whether some of the submissions were invited.

Though we know that this is not a Report based on a random sample, it is still interesting to see the composition of the submissions (table 1) in order to analyse the extent to which the methodology used may have affected the results and recommendation.

Table 1: Breakdown of written and oral evidence by type of institutions and subject areas

	Written evidence	Oral evidence
Institutions		
Publishers	6	4
Universities	5	1
Governmental/public	8	8
Learned societies	23	3
Research Institutions	7	4
Subject areas		
Medical/Health care	22	5
Natural science (general)	4	3
Biology and biochemistry	8	0
Physics	5	1
Chemistry	1	1
Mathematics	3	0
Environment/Climate	11	0
Social Sciences ⁹	13	0
Technology, engin., info systems	8	1
Education	2	0
Science communication	2	0
Humanities	2	0

Note: The allocation to subjects and institutions is not always straightforward and therefore figures must be considered as approximate. The evidence of people in an individual capacity is taken account of in the subject but not in the institutions list.

Source: The data derives from the Report 'List of printed written evidence' (by those who have given oral evidence) and 'List of additional written evidence'.

The scope of a thorough analysis of the PR system in publications is multidimensional and involves issues of subject cover, of type of publications and of the national versus international dimension. Regarding the matter of academic subjects the boundaries of the Report are set in the title: Peer review in *scientific publications*. This means that the use and impact of peer review in the humanities is not considered. In fact, I could only spot two written submissions from the humanities (see table above). However, one of these is from a philosopher of science and mathematics (PR 22) and therefore, to a large extent, he can be considered as part of the scientific community or, at least, as someone with knowledge of the sciences. The second is from a historian (PR 85), the editor of a prestigious journal. He touches on pluralism, a particularly important issue in the humanities as well as in the social sciences.

Though the title mentions 'scientific publications', the Report concentrates mainly on scientific publications in journals, thus excluding scientific works published in books – authored or edited – and in conference proceedings. The latter as well as edited collections of papers are

⁹ Of these only a maximum of three could be ascribed to economics.

a very common vehicle for the dissemination of scientific research. Most conferences in the sciences scrutinize the submitted papers very closely via PR systems.

Regarding the geographical scope, most journals in English language are now fully international in terms of the nationality of authors, editors and reviewers. The team of editors is often an international team which draws on specific skills from many countries. However, there may still be significant location-bound patterns in the choice of reviewers. The Report notes the geographical imbalances in terms of contributions to authorship and to reviews (p. 43-4). It is reported that while the USA 'produces about 20% of the output of papers, its researchers are responsible for approximately 32% of the reviews in the world, whereas China is producing something like 12% to 15% of the output of papers but is probably only conducting about 4% to 5% of the reviews.' (p. 43, para 125). The information for the Report comes mainly from British institutions with the possible exception of publishers who are international ones. All but two of the written submissions are British-based. The exceptions I could spot are: a submission from the American Meteorological Society (PR 48) and a joint submission from two educationalists from the University of California at Berkeley (PR 88)¹⁰.

Most submissions are from academics or people connected with institutions linked to academe. There are two exceptions: a non-academic engineer (PR 30) and the defence contractor Thales, Defence and Mission System Domain, UK (PR 83). Both of these consider the technological and business implications of having the results of research reliably evaluated.

3. Peer Review: what is it about?

I agree with the very first line of the Report that in the most general terms PR is review by experts. However, this simple definition covers a variety of systems with different characteristics specifically with respect to the following issues.

- Who are the reviewers and how are they selected?
- What are the ultimate aims of reviews by experts?
- Is the review single-blind? Double-blind? Or open?
- Time: is the review done pre- or post-publication?

In the traditional peer review system a paper is submitted to a journal; the editors read it, and if they think it passes an initial threshold in terms of competence and adherence to the scope of the journal, the paper is sent to reviewers; usually three reviewers are involved though fewer as well as more are known to be consulted at times. The reviewers are asked to send a full anonymous report to be disclosed to the author(s) as well as confidential recommendations for the editor(s)¹¹. The threshold for publication – how many positive reviews and recommendations are needed – varies with the journal or conference. It is this type of review that most people in academe, media and wider public have in mind when they/we talk of peer review. Yet this is not the only possible type of review process by expert, there are others and we shall consider them by analysing the issues raised in the five bullet

¹⁰ They are the authors of the already cited Harley and Acord (2011) and are, therefore, writing as experts in PR rather than as educationalists.

¹¹ The traditional procedure for acceptance of papers at conferences is very similar. Book proposals - and sometimes the full manuscript or selected chapters - are reviewed by experts selected by the publishers.

points above. I shall refer to the traditional peer review system as TPR and will label PR the peer review system in general i.e. any process in which papers are considered by expert(s) before or after they are put into the public domain.

Who are the *reviewers*? As far as I know all the people who review papers for publication are *experts* in the general field. They are selected by the editors. Some journals accept suggestions by the authors among the possible reviewers. In a few journals or conferences the papers are reviewed by the editors only and they decide whether to publish or not. The degree of scrutiny is less than in the TPR but it is still an expert-led process: the editor is usually an expert in the field. Occasionally s/he may consult others. Among the advantages of this system are speed of decision, consistency and transparency. However, there are downsides to it. A big problem with this system is that the decision is taken by a single individual and thus the probability of detecting errors, fraud, or the ground-breaking contribution may be low. Correspondingly, there may also be a low degree of trust in the reliability of the research by the readership.

Let us now consider what the *aims* of peer review are. There are several and specifically the following.

(a) Quality assurance. The editors want to know whether the paper falls within the field and scope of the journal; whether it makes a contribution to knowledge and whether it represents, generally, a competent and novel piece of research. Ideally the editor would want the reviewers to detect errors and/or fraud.

(b) Help in improving the research paper. Referees are expected to – and often do – make positive suggestions for the advancement of the research topic.

(c) Guidance to editors in the allocation of limited journal space. This is probably the most important function of the TPR system. Most journals – particularly the prestigious ones – receive far too many applications for the available journal space and they need an allocation mechanism that scales down the supply of papers to the demand by editors (constrained by the journal's space). In the TPR system the reports from reviewers are the filtering mechanism for such allocation. The Report notes that in allocating space the editors consider the quality of the paper according to the reports as well as its potential impact factor (IF). The impact factor that a paper can make to the journal depends on its contribution to the citation of the journal. The IF may derive also from media interest in a particular article.

Blind versus open PR? In double-blind systems the names of the authors of papers and those of reviewers remain undisclosed to each other. Some journals operate a single-blind system in which only the names of the reviewers are undisclosed to the authors but those of the authors are given to the reviewers. Blind systems are seen as being less prone to bias and to the creation of problems at the personal level between authors and reviewers. The Report (p. 11-12) considers these various options and one expert, the Chair of the Committee on Publication Ethics (COPE) is reported to have expressed the view that it all depends on the discipline. 'With a discipline as big as medicine, where there are hundreds of thousands of people all around the world you can ask and they probably don't bump into each other the next day, open peer review seems to work. In a much narrower and more specialized field, it perhaps does not, and the traditional system of the blinded review is perhaps better' (para 19). There is a problem here: in small fields, people know who is working on what and thus identifying the reviewer may be easier than in a large field. The air of suspicion and of knives put in under cover of anonymity, possibly by friendly colleagues, may poison the profession much more than open discussion. Open peer review (OPR) systems are also based on

experts' comments¹²; however there is no anonymity of either authors or reviewers as we shall discuss in Section 5.

The *timing* of peer review: pre- and post-publication reviews and commentary. TPR usually refers to ex-ante, pre-publication review. There are, however, currently many initiatives aiming at the review of papers already in the public domain. They fall into various categories partly depending on their aims. Many traditional journals publish comments on previous articles. The Report mentions that the *British Medical Journal* encouragement of readers' letters is very successful. However, it is reported that the Royal Society encouragement of letters had a low take-up rate (p. 66).

For those papers disseminated via posting on web sites or in special repository such as Xiv for physics (Ginsparg, 2002) the functions of post-dissemination PR is twofold. (i) To contribute to the development of a research paper; (ii) to alert the scientific community of new research in a specific field; and (iii) to help potential readers: reviews of papers in the public domain – whether disseminated by publication or through other processes – may also have the aim of guiding readers through a large and increasing mass of research papers. The latter function is behind the development of the Faculty of 1000 in the biomedical sciences.

4. What is wrong with TPR?

The Report lists the following criticisms of the TPR. (a) it stifles innovation (p. 15); (b) it is biased in terms of the gender of authors, their geographical provenience and ideas; (c) it discriminates against multidisciplinary work; (d) it is very expensive and burdensome and it delays the appearance into the public domain of research results; (e) there is little evidence of its efficacy. The Report gives testimony in favour and against these criticisms. It ends by recommending some minor improvements and specifically to: give support for editors and reviewers via training (particularly of young academics) and via the development of relevant packs¹³; give recognition to the work of reviewers as an incentive to perform the task; use reviewers from various fields in multidisciplinary research; and play down the assessment of impact factors in favour of concentration on the assessment of technicalities and coherence.

The criticisms of the TPR system on the basis of efficiency (point d) – use of resources and their cost - and effectiveness (point e) - how good it is at achieving its aims - have been going on for some time¹⁴. Many authors have criticized the high and increasing social costs for the academic community and the length of the publication process (Campanario, 1998a and b; Ginsparg, 2002; Frey and Osterloh, 2007). Several authors have also criticized the low effectiveness of TPR in terms of quality assurance such as the detection of errors or of plagiarism or the weeding out of very poor research (Campanario, 1998a; Bedeian, 2004). The imposition of the reviewers' views on the authors have been criticized by Frey (2003).

¹² An extensive discussion of various systems of OPR is in Harley and Acord (2011, background paper 2: pp. 41-53)

¹³ The publisher Elsevier states that it provides a Welcome Pack introducing new editors to '...its policies, procedures, the editorial and publishing teams which support the journal, the peer review process including tools to find reviewers, ethical guidelines, as well as support tools.' (p. 37-8).

¹⁴ These issues are discussed at greater length in Ietto-Gillies (2010).

The Report discusses the Public Library of Science (PLOS) initiative which aims to reduce the lag between submission of papers to journals and publication. The PLOS manages commercially seven academic journals in the biomedical sciences. The PLOS 'uses peer review to determine whether a paper is technically sound and worthy of inclusion in the published scientific record'. The system has advantages and problems. The Report cites the Wellcome Trust as stating that because the PLOS approach 'focuses solely on whether the findings and conclusions are justified by the results and methodology presented, rather than on assessment of the relative importance of the research or perceived level of interest it will generate [it] has both reduced the burden on the reviewer and the time it takes to get a paper published' (p. 29, para 79). Among the problems mentioned in the Report is the fact that the system relies on a fee to be paid by the author and this may introduce an element of suspicion in the process. Moreover, there are, in the Report, comments to the effect that the editing work may not be always carried out to a high standard.

As a way of cutting the cost of reviewing for the research community, the Report discusses (p. 49-50) and recommends cascading of reviews from journal to journal: i.e. editors who reject a paper send the reviews to editors of a sister journal with the agreement of the author(s). However, it was noted that authors are reluctant to accept cascading. I would also like to note that the system would favour large publishers with a range of journals in each specialized fields. If widely adopted, it might lead to further concentration in the industry and further power to those publishers who already have considerable market power.

TPR and ground-breaking research

The most damaging criticism of TPR relates to its alleged inability to detect ground-breaking research. The literature discusses many examples of this (Horrobin, 1990; Gans and Shepherd, 1994; Campanario, 1995). The Report gives some examples – from medicine (p. 16) - of innovative research which was not recognized by the TPR system. But, on the whole, the interviewees in the Report do not seem over concerned about this issue. One interviewee is reported as stating that 'conservatism is not a bad thing in science or medicine in terms of making sure that what we publish is robust, relevant and properly quality controlled' (p. 17). It is unclear to this reader how failing to publish ground-breaking original research can be seen as good for science and medicine and why quality control should necessarily be associated with conservatism in science.

Sir James Black, the 1988 Nobel Prize winner for medicine, did not mince his words on his views regarding the impact of TPR system on innovative research. In a Financial Times (2009) interview he is attributed the following statement: 'The anonymous peer review process is the enemy of scientific creativity....Peer reviewers go for orthodoxy...'. Another example is given in The Guardian (2011). It is reported that the discovery of Daniel Shechtman - the 2011 winner of the Nobel Prize for Chemistry - was, at first, rejected by peers and he was asked to leave his research group to which he was, allegedly, bringing disgrace by his theory and findings.

Gillies (2008) gives a philosophical reason – based on an application of Kuhn to the research evaluation field – of why it should be so. He claims that the TPR system is likely to favour orthodox research, the type of research that operates competently within a well established and majority paradigm rather than research which is ground-breaking. Yet, the history of science shows that, while the former type of research may be relevant, it is the ground-

breaking research that gives science, the economy and society the best returns in the long run.

It could be claimed that failing to spot the *very innovative paper* can happen under any PR system and, moreover, that it is not that drastic a mistake since, in the end innovation will prevail anyway. The last point can be dismissed by noting that delays in the publication of fundamental results delay their further development by other researchers. They may be life-saving innovations or major innovations for business and the economy. Moreover, it may lead to a serious disillusionment of top researchers who see their work rejected while competent but hum-drum research is published and receives accolades.

Let us now deal with the first point: any system can go wrong. Let us see whether failing to spot ground-breaking research is just a matter of incompetence or poor work on the part of the reviewer. If that were the case, then better selection and training of reviewers would go a long way towards reducing the problem. However, this is not the case. The problem arises because of the nature of research. In order to support these statements, I will here make use of Gillies (2012) philosophical approach to the problem. His argument is that we all work under a specific paradigm and see all the work we read through the spectacles of that paradigm. In this perspective it becomes difficult – though not impossible – to spot work that does not conform to existing paradigms and may be the beginning of a new one. So, how do we overcome this problem; after all, as reviewers, we are all involved. We can all make mistakes and fail to recognize the innovative research paper simply because we look at the issues through the spectacles of the paradigm we are working under. Yes, the problem is intrinsic to research. However, it can be made more acute when there is lack of pluralism in the discipline because this raises the probability that all or most reviewers adhere to the same paradigm. In order to limit this problem, it is important to open up the reviewing process to researchers belonging to different schools of thought, communities and countries. We shall discuss these points further in the next section.

Impact factor (IF)

The dreaded IF is everywhere these days: from academe to media. It affects the type of paper published and the rating of research projects, output and institutions. But what is it? What does it refer to? Who benefits from its measurement and assessment?

Impact factor can signify (a) the effect/impact that a particular paper may have on the journal that publishes it via: effects on the readership; on journal's subscriptions; on possible increase in citations of the journal and on the journal's media visibility. So the quality of a paper and the reputation of its authors will have an impact on the journal. (b) Similarly a high impact journal will enhance authors' reputation, their job and promotion prospects as well as their prospects in grant applications. The Report writes: '...publication in a high-impact journal is frequently used as a proxy measure for assessing both the work of individual researchers and research institutions.' (p. 54). However, in the same page the representative of the UK Research councils (RCUK) states that: 'there is no absolute correlation between quality and place of publication in both directions'.

Those mentioned in (a) and (b) are the type of IFs that the Report mostly concentrates on. They are impacts which remain within the confines of academe: they are in the realm of citation, journal and authors' reputation within academe. However there is a wider meaning to impact: (c) the effects of a piece of research on business, society and governments. Journals'

editors may sometimes be interested in these types of impact. In the latest version of the UK research assessment systems – the Research Excellence Framework (REF) in which the whole of a country's research output is assessed using rating scales – the applicants are encouraged to specify this type of relevance of their work.

There are two further issues in relation to impact factors. First, the timing. The IF can be ex-ante and thus related to the assessment of the possible impact of the research: this is done in grant applications and in the editor's decision on whether to publish or not. IF can be seen also as ex-post assessment. After the research has been done and published, what impact has the work had on society? Some research brings effects shortly after its results are disseminated. Other types of research take longer. Fundamental research sometimes takes decades to show its full impact. In fact, the more innovative the research, the more likely it is for its impact on the research community as well as on society as a whole to manifest with a long delay. Yet innovative research is often the one that brings most benefits; but it brings them with a lag, often a long lag. Moreover, as noted above, very innovative research is the one most difficult to detect in the TRP system.

5. For an Open Peer Review system

The current TRP system developed gradually during the pre-internet era. However, the digital technologies have brought many changes and opened up immense opportunities not yet fully exploited. In Section 1 we briefly discussed the opportunities to the dissemination function of research via Open Access (part one of the academic spring). Digitalization has also been extensively used in the administrative and editorial work of journals and their review process. Moreover, the same technologies are also bringing major changes in the very process of evaluation via OPR systems: the second part of the academic spring. Such major changes would greatly diminish some of the faults of the TRP highlighted in the previous section.

What are the characteristics of an OPR system? It is a system open in two respects. First, because both the authors and the reviewers' names are disclosed. Sir James Black puts the emphasis of his criticism on *anonymous* TPR. What are the pro and cons of anonymity? Some of the pros have been discussed above; they boil down to the fact that in the end TPR has to do with allocation of space and with helping editors to weed out papers; it is largely about how to exclude papers from publication in a specific journal. The general culture under which TPR operates is one of helping the editors to exclude papers because of the scarce space available in a specific journal: being a culture of exclusion the tasks are more easily performed under anonymity. However, given that journal space may no longer be a limiting factor, are we in danger of continuing with the wrong attitude? Shouldn't the intercourse/dialogue between researchers be on how to further develop research rather than on exclusion? It is claimed that, if identities are disclosed, the reviewer will be less likely to be critical and criticism is essential to the development of research. However, when we review books we are not averse to being very critical¹⁵. Why should we not use the same standards in reviewing papers?

So far concerns about the quality of work placed into the public domain has centred on preventing poor quality papers reaching readers. While not denying that this must be a concern of the research community, there is a much more serious quality problem being

¹⁵ Battles between authors and reviewers are known to have raged in the columns of newspapers and occasionally even in the law courts.

ignored: the rejection of ground-breaking work to which the TRP is more likely to lead compared to an open system. In other words the TPR is obsessed with avoiding Type II errors and not with Type I errors. Yet, the consequences of the latter may be very serious and long-lasting (Gillies, 2008: Ch. 4).

Moreover, concerns about misconduct in research and publications tend to centre on authors. Yet there can be serious cases of misconduct by editors and/or reviewers, as mentioned also in the Report (p. 77-8). They include the following: sloppy and incompetent reports with hastily developed arguments; promotion of the reviewer's own works; support for a friend's paper or damning a competitor's paper (and worse still preventing/delaying publication with a view to publishing similar ideas); rejection of papers which are clearly inspired by a paradigm alternative to the one in which the reviewer is working¹⁶. Lack of anonymity may be a deterrent to such cases.

Moreover, if the reviewer is allowed to disclose her name and to get credit for the contribution she makes, she will be more likely to come out with novel points knowing that they will be attributed to her. What I am saying is that the move from a culture of exclusion to one of research development would enhance the quality of debates between authors and reviewers and lead to the improvement of research work. The disclosure of identities of authors and reviewers would form part of that cultural shift. All the above are some of the reasons why OPR is a more rigorous reviewing system than TPR.

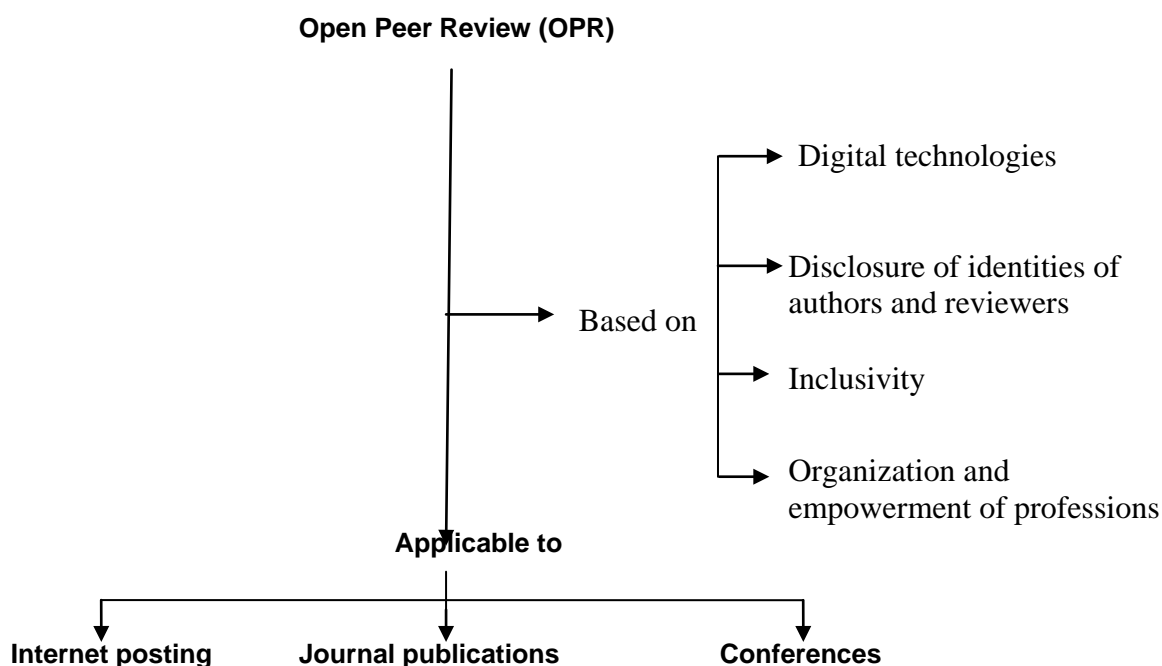
Second, the system is open because the reviews are *inclusive* of views from different theoretical and paradigmatic perspectives and with respect to views from different communities, countries, cultures. To achieve the latter type of openness the process must be open to many, many potential reviewers from different countries and communities and belonging to the many theoretical perspectives that enrich each discipline. This is now possible through the use of digital technologies and this is what I mean by saying that the digital technologies can and must be used in the very process of reviewing. It is only by opening up to the large number of researchers in each specialized field within disciplines that we can reach the experts from different theoretical perspectives and communities. In order to achieve this two conditions are necessary: (a) the professions must be empowered to take charge of the PR process; this involve among others, releasing resources for the organizational work to be carried out; and (b) researchers must slowly shift the focus from reviewing to exclude research results from being published to reviewing for the development of research. The process can be self-reinforcing. Suppose that one reviewer – among the possible many – spots the ground-breaking work or the data fraud or plagiarism. If her comment is posted, it can be read – potentially – by many researchers in the field and some of them may join in with arguments for supporting or rejecting the claims. The author of the paper can, of course reply openly to the criticisms

Open peer review systems can be applied to journals, to internet posting and to conferences (Fig 2). They are gradually being developed in several disciplines and mainly for journals. Koop and Poschl (2006) discuss a successful OPR system – based on a mixture of anonymity and disclosure of names - for the journal *Atmospheric Chemistry and Physics*. The

¹⁶ All these cases are known to occur with a variety of frequencies. The instances of reviewers recommending their own work may increase in line with a move towards citation-based assessment of research at the level of countries. The same move may increase the pressure on authors to cite papers from the journal in which they aim to publish thus increasing the IF of that journal and pleasing the editor. The latter may also be a self-serving strategy: authors know that, often editors choose reviewers from experts who have already published with them.

British Medical Journal has been using an OPR system successfully for more than a decade (Report, p. 26, para 23). *Nature* has run an experiment in OPR for four months; however, in its case the take up rate from both authors and commentators was low and the experiment was stopped. The editor comments that in his view ‘...scientists are much better motivated to comment on an interesting paper when directly requested to do so by an editor’ (p. 27, para 74). It should be pointed out that this case raises two different issues: (a) whether the review process should be carried under anonymity; and (b) whether editors should rely only or entirely on spontaneous comments or should solicit them for specific experts in the field. A system that is based on disclosure of reviewers’ names does not exclude the soliciting of reviews as the editor of *Nature* seems to imply.

Figure 2 Open Peer Review. Characteristics and applicability



An OPR system for economics has been developed by the World Economics Association (WEA). The WEA was established in May 2011 (www.worldeconomicsassociation.org) with the aim to develop and manage academic activities in the field of economics entirely online and in a pluralistic – from the point of view of approaches to economics - and inclusive way. Its activities include online journals and online conferences. Its two new journals apply an OPR process at the pre-publication stage; they have also a Post-Publication Commentary as a standing feature of each journal. Following an initial screening by the editors, the papers are posted on a *Discussion Forum* and reviews are invited. At the end of the process the editors decide on whether to publish the paper following possible amendments to take account of the reviews. At the discretion of the editors, some reviews may also be published. All the WEA activities are run for the benefit of members. Conferences are not location-bound but internet based. Members are invited to register and to contribute papers as well as text-based comments to posted papers. The comments are posted with the names of contributors. Membership of the WEA – currently at c. 10,000 and from over 150 countries - is free and donations are encouraged. Most work is done by volunteers from all over the world. Some

volunteers are retired¹⁷ and some are working academics. Software and technical expertise are currently paid via voluntary contributions by members.

There are, of course, problems with Open Peer Review systems; two in particular. The first one is that some authors and reviewers are reluctant to have their identity disclosed. The second problem is almost the opposite of what one might have expected. It would not have been unreasonable to expect a flood of reviews/comments when the number of potential reviewers is so large. Yet, these early experiments – including the one from the WEA - indicate the opposite: people are reluctant to come forward with reviews. Both these problems may be due to difficulties in shifting the culture of reviewing from one of secrecy to one of openness and from one aiming at exclusion to one aiming at scientific development. It will require time to overcome these problems. Meanwhile the editors can take several steps to continue their valuable work: from accepting anonymity of reviewers in special cases to soliciting reviews from known experts.

6. Open Access, Open Peer Review and economics

The issues under discussion are – or should be – of special interest to economists for various reasons. First, because when – and it is now a matter of when not if – the academic spring turns into academic Summer there will be major economic consequences. Open Access will cause the collapse of an industry already under threat; or at least of the industry as we know it. There are, in fact, within the publishing industry, very valuable skills that will still be needed. What sort of industry structure is likely to emerge from a move towards full utilization of digital technologies in the dissemination function of research? And what policies can be recommended to secure the best utilization of existing resources – and indeed their development – in the emerging new structures? How might the resources released from moving to a less expensive dissemination system be better utilized within the academe? Funds saved from the move towards Open Access in the dissemination process can very usefully be allocated to the development of OPR systems in the various disciplines and their specialized fields.

Second, economics has, recently, been in the paradoxical situation of being the highest rated subject in a national evaluation process (the UK Research Assessment Exercise 2008) just at the time when the world economy was collapsing and when there started a considerable amount of questioning of the economics profession from within itself and from outside the discipline. The British Queen, when visiting the London School of Economics in November 2008, asked the now famous question about why nobody – in the economics profession – had noticed that things were wrong. This raises further questions and issues for our profession and for society at large in particular the following.

- (i) Why the few who did notice and speak were ignored.
- (ii) What is the connection between (i) and the lack of pluralism in the discipline.
- (iii) Are there causal links between the TPR system and the lack of pluralism¹⁸.

¹⁷ Such as the present author.

¹⁸ The questions in (ii) and (iii) are explored in Gillies (2012).

(iv) What is the connection between research evaluation via TPR and the antiquated, inefficient and expensive dissemination system which is now crumbling in favour of Open Access? It can be claimed that, were it not for the intense competition for high ratings in the research race, the academic publishing industry might have already entered its final stage. As it happens, the research rating institutions, such as the British Research Excellence Framework – REF - with their effect on the rating of journals and of research papers sustain the publication of journals and indeed they have led to its huge increase in the last few decades. TPR plays a big role in this because it helps to keep alive the hierarchy of journals.

(v) In economics the links between economic theories/ analyses and policies are very close. Policy action towards Open Access on the part of the UK Minister for Science and Technology would have big implications for the industry. So would a move towards OPR systems of evaluation of research.

(vi) The research community and the publishing industry are largely international. What will be the repercussions of moves towards OA at Harvard University or in the UK universities on other countries?¹⁹

The last thirty years have seen the gradual marginalization of minority paradigms in favour of the neoclassical paradigm with emphasis on the supremacy of the market. This was not always the case. Economics had been a more plury-paradigmatic subject for a long time. The decades after WWII have seen the coexistence of several paradigms with heated debates among its exponents: I witnessed and remember the strong exchanges between economists of Cambridge, Massachusetts and those of Cambridge, Britain on approaches to theory, analysis and policies. From there we have moved more and more toward the dominance of a single paradigm. To what extent has the TPR system contributed to this? To what extent is this state of affairs leading to preference for the TPR system? To what extent has this contributed to the current economic crisis?

There may be a strong link between TPR, the hold on the subject by orthodoxy and the power of large publishers. Thus the need for a full academic spring in economics is even higher than in other disciplines. Economics had a low profile in the Report: only three identifiable written submissions. One was from this author who, however, wrote not qua economist but qua researcher interested in the reviewing process in general. The other one – more specifically from economists and about economics - was from the Association of Heterodox Economists (AHE); the third one - from the Regional Studies Association - is not strictly an economics only input. It is a pity and a surprise that neither the long-established and prestigious Royal Economic Society nor any other association of economists felt it necessary to lodge a submission²⁰. To what extent is the low profile of economics in the process leading to the Report and in the Report itself the result of the turmoil in the profession? I have no answer to these questions; just a sadness about the poor state of economics and its near absence from the Report at a point in time when much is needed from it.

¹⁹ Question (v) figure in a list of issues considered in Fullbrook (2012).

²⁰ The submission by the Academy of Social Sciences (ASS) states that it is the result of consultation of societies within the group and that some of these societies may be lodging their own submissions. It is not disclosed which societies may have contributed to the input by the ASS.

7. Conclusions: two parts of the academic spring and the report

The introduction pointed out how there are two parts to the academic spring: one related to Open Access (OA) and one to Open Peer Review (OPR). Following a critical analysis of the TPR system the paper presented a general version of an Open Peer Review system. The latter is seen to be *open* in two respects: because the names of both authors and reviewers are disclosed; and because the system is inclusive and thus relies on large number of potential experts in the specific field, belonging to diverse discipline paradigms, cultures and countries. OA and OPR are closely linked. First because they are both made available and are bound together by the digital technologies; and second because it is the existing and now antiquated dissemination process involving large private publishing companies that has most interest in maintaining the TPR system. The research community's interest rests with the OPR system. A proper functioning of the latter requires (Fig 2): (a) full utilization of the digital technologies in both the dissemination and evaluation phases of research; (b) disclosure of identities of both authors and reviewers; (c) inclusivity of researchers both in terms of paradigmatic appurtenance and communities/countries; and (c) the full involvement and empowerment of the professions in the evaluation process.

This makes the more glaring what is, possibly, the biggest fault in the Report: the missed opportunity to explore the links between the OA and OPR including an exploration of the implications for both the research communities and the publishing industry. Analysing the interconnections between OA and OPR would have turned out useful to the Minister in charge of Science and Technology, the very one who has announced the 'seismic change' in the dissemination function of research. Is this failure linked to the fact that several big publishers made submissions and that most of them were invited to make oral submissions? Might this have biased the content of the Report even if only indirectly? Might this affect the policy action by the Minister towards maintaining an antiquated quality assurance process in the interest of publishers and in the misconceived belief that TRP is the only way to assure quality?

This fault emanates directly from the main problem of the Report: it is, in my view, a rather backward document; looking more at the XXth than at the XXIst century. Though there is a great deal about open systems, digitalization and experimentation most of the pronouncements refer to the traditional peer review process. The full potential of digitalization on research processes – in both OA and OPR, the two parts of the academic spring – has not been explored. Neither have the full implications of the internationalization issue touched on. If Chinese or Brazilian scholars are not much involved in PR and if authors from these countries feel that they can only get published by becoming co-authors with researchers from the US or Britain, we do not have just a problem of equity. The world research loses the benefits of alternative approaches. Pluralism is very important in all sciences; in the social sciences and humanities it is essential. The TRP militates against pluralism and we have seen the disastrous consequences of economics moving more and more into the status of prevalent-paradigm discipline in the last three decades.

Nonetheless a full evaluation of the Report must take account of two provisos. First, as with many political documents it is possible to read many things into the Report. There are enough ambiguities to satisfy almost everybody. Second, the Report is not – and must not be read as – a piece of research. It is a Report based on expert witnesses who are mostly self-selected; they do not represent a random sample of researchers or of people affected by the review system. The ones that the Committee chose for oral testimony are not a random sample of those who sent in submissions: most interviewees are people in position of power and

responsibility; moreover, those who made submissions are not a random sample of the research community. A major missing element are the *direct* views of junior and middle rank researchers whose problems were reported only indirectly by more senior people. The direct views of more junior researchers would have given the Committee a better feel for what it is like to be at the coal face of research both as a passive receiver of reviewers' reports and as an active reviewer.

Sampling techniques and representative testimony was not what one should have expected. However, there are problems arising from the evidence partly due to the chosen sample and partly to the set scope. Peer review is a general process used in research independently of the subject matter. The exclusion of the humanities from the evidence is a great pity because of their relevance to society in general and because the issues and problems present in the humanities have affinities with other disciplines (for example the social sciences including economics). Moreover, given the size of the field, humanities publications have also a big impact on the publishing sector.

Nonetheless, the Report is an important document. As expression of the engagement of Parliament with the research community and its problems, the Report is most welcome. Its potential relevance derives from the possible political impact on government and on various other public institutions such as the research funding bodies or the institutions in charge of research assessment at the country level.

As regards the dissemination and evaluation functions of research my own view is that the incoming spring in both OA and OPR is most welcome. Together they are really seismic changes requiring changes in organization of various research functions, in the funding of research and, indeed, in the culture of research evaluation. We need a shift in the focus of PR function from exclusion – no longer necessary given the removal of space constraints from journals – to the development of research. The full acceptance of this shift requires a change in the culture of reviewing. This is not an easy change. Both authors and reviewers may feel challenged by the removal of anonymity. Potential good reviewers may be slow in coming forward and expose themselves to the full glare of many readers of their reviews. This accounts for the slow take-up opportunities when editors first move into an open system. Nonetheless, the cultural shift is happening though gradually: we must embrace it, develop it and solve its related problems as they arise; not fear it. The academic spring is now well under way and full Summer will eventually be with us.

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SUGGESTED CITATION:

Grazia Ietto-Gillies, "Open peer review, open access and a House of Commons report", *real-world economics review*, issue no. 60, 20 June 2012, pp. 74-91, <http://www.paecon.net/PAEReview/issue60/IettoGillies60.pdf>

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