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WHAT KIND OF PEER REVIEW FOR PATENTS?

In some ways, the peer-to-patent initiative exemplifies the return of the repressed -- one that has been kept out of sight for more than two centuries.¹

The Patents Bill of March 1790 – the immediate predecessor to the first US Patent Act of April 1790 – stated that, upon receiving a patent application, the Secretary of State:

Shall make out an advertisement, to be inserted by the petitioner in one of the news papers published at the seat of government of the United States, and in one of the news papers published in the State where the petitioners shall reside, for the term of eight weeks, once at least in each week, giving notice of such application, and containing a short and general definition or description of the invention or discovery, requiring all persons concerned to appear before the said Secretary of State [...] not less than forty-two days, nor more than ninety days next following, to shew cause why letter patents [...] should not issue...²

¹Beth Simone Noveck, “Peer to Patent: Collective Intelligence, Open review, and Patent Reform,” *Harvard Journal of Law & Technology* 20 (2006): 123-286, but see also the various papers at <http://dotank.nyls.edu/communitypatent>.

² Patents Bill [H.R. 41] March 10, 1790, Sec. 1, reproduced in Edward Waltescheid, *To Promote the Progress of the Useful Arts: American Patent law and Administration, 1787-1836* (Littleton, Col.: Rothman, 1998), pp. 455-6.

As the bill made no mention of ex-parte examination by government officials, it appears that the patent would have automatically issued in the absence of peer opposition. But if,

Upon the notice so as aforesaid given, any person or persons shall appear before the said Secretary, and shall shew cause as to him shall appear reasonable, why letters patent [...] should not issue to the party petitioning for the same, and the petitioner doth not acquiesce in the opinion of the said Secretary, the petition shall be referred to three judicious, disinterested persons, to be mutually chosen by the parties, or if they do not agree in such choice, to be appointed by the Chief Justice of the Supreme Court...³

The bill did not pass and, just a month later, the first US Patent Act introduced a very different approach to patent examination. It included no provision about the advertisement of summaries of patent applications, the request of information about unknown prior art from interested third parties,

³ It continues: "...which referees shall hear the parties concerned, and the evidences that shall be by them produced, and if upon such hearing it shall appear to them, or any two of them, that the thing or things for which the patent is prayed, was or were before the application to the said Secretary, used by, or known within the United States, to others than the petitioners, or those who derived their knowledge thereof from or under him or them, they shall certify the same accordingly; and such certificate shall be deemed a sufficient cause to stay the issuing of such letters patent. And the said referees may require each of the said parties to deliver to them such specification of their several inventions or discoveries, as are herein before mentioned, signed by them, and upon comparing the said inventions or discoveries, the said referees shall determine and judge whether they are substantially the same, or whether they differ from each other in any material circumstance, and if they be found so to differ, the said referees or any two of them shall certify each of them severally, with their specifications, to the Secretary of State; to the end that such patents as aforesaid may issue: And the said Secretary is hereby required to cause such patents to be made out, proceeded upon, and perfected in the manner herein before mentioned, to each and every of the said parties. And if such specification, the inventions or discoveries aforesaid, claimed by two or more parties, shall appear to be substantially the same, then the said referees shall enquire into, and determine the priority of the said inventions or discoveries, and certify the same to the Secretary of State," Sec. 3, reproduced in Walterscheid, *To Promote the Progress of the Useful Arts*, p. 457.

and the pre-award, out-of-court arbitration by a panel of three experts reporting to the Secretary of State. The first Patent Act completely removed the function of patent examination by peers and attributed it to the government.⁴ It also replaced pre-award arbitration with post-award litigation by stating that “within one year after issuing the said patent” opponents of the patent could ask the judge of the District Court where the patentee resided to review evidence that he “was not the first and true inventor,” and that the court could render a judgment on the matter.⁵ The basis of today’s system of patent litigation was thus established.

The legislative history and evidence is too thin to explain the reasons for such a radical reversal over just a few weeks, but a reasonable guess is that the constraints imposed by contemporary means of communication played a substantial role in it. The 1790 Bill required the applicant to publish an abstract of the application in at least two newspapers (one in Philadelphia and one in the applicant’s state of residence) at least once a week for eight weeks. The drawbacks of the less than capillary diffusion of such notices (likely to be missed by anyone who did not happen to live in those cities and read the paper with care pretty much every day) were compounded by the further burdens imposed on the external reviewers. They were in fact required to travel to deliver evidence of prior art *in person* to the Secretary of State, on a date and time included in the printed ad.

⁴ “It shall and may be lawful to and for the said Secretary of State, the Secretary for the Department of War, and the Attorney General, or any two of them, if they shall deem the invention of discovery sufficiently useful and important, to cause Letters Patent to be made out in the name of the United States,” US Patent Act of 1790, Sec. 1, in Walterscheid, *To Promote the Progress of the Useful Arts*, p. 463.

⁵ US Patent Act of 1790, Sec. 5, reproduced in Walterscheid, *To Promote the Progress of the Useful Arts*, p. 467.

The radical change in novelty requirements between the March 1790 Patent Bill and the April 1790 Patent Act may have also played a role in the early demise of peer review of applications. While the bill stated that inventions had to be not “known and used in the United States” in order to be patentable, the act passed a month later dropped the restriction of novelty to the United States, turning the novelty requirement into an absolute one that was to be slightly amended only in the 1836 Patent Act.⁶ The newly tightened novelty requirement made necessary by the pressing political need to differentiate patents from ancient regime monopolies could have been hardly implemented by polling prior art (which at this point included foreign knowledge and use) only from the limited number of people who happened to read small notices in two newspapers, one of them likely to be a provincial venue.

In the absence of a suitable communication infrastructure, it makes sense that the 1790 Patent Act dropped a very local and restricted form of patent peer review in favor of a model of ex-parte examination coupled with post-award litigation. Such an approach provided *more time* to possible critics to allow them to learn about the patent through the *relatively slow* networks of communication then available. By the same token, it seems unwise to still hold on to a system that may have been introduced because of infrastructural limits that are no longer with us today. Without going so far as to say that the figure of the patent examiner was a mere byproduct of the absence of cyberinfrastructure in 1790, it is safe to say that the emergence of that role resulted not so much from legal theory but from mundane

⁶ Mario Biagioli, “Patent Republic: Specifying Inventions, Constructing Authors and Rights,” *Social Research* 73 (2006), No. 4, special issue on “Politics & Science,” in press.

considerations about how to get to prior art given the constraints imposed by communication technologies at that time.

But if history seems to lend support to suitability of a return to the peer-to-patent model, it also shows that the notion of “peer” is very difficult to translate across time and disciplines. The “peers” envisioned by the 1790 Bill where, in fact, nothing but competitors of the applicant. No attempt was made to say that they were motivated by a desire to improve the patent or to gain the respect of their fellow peer reviewers, or that they should have been rewarded by something other than the successful invalidation of the application. In this sense, the peer reviewer envisioned in 1790 were more like today’s patent “bounty-hunters.”⁷

As I try to argue in the rest of the paper, peer-to-patent models seem to be definitely on the right track when it comes to addressing the problem of retrieving relevant prior art (especially non-patent art), but they may be less convincing when trying to envision the motivation and rewards of the peer reviewer and the relationship between the peer reviewer, the examiner, and the applicant. The issue of motivation and reward has been frequently raised in relation to open source/free software environments, but has been rarely addressed in a systematic manner.⁸ The challenges posed by the peer patent review model, however, are more complicated. On top of the usual issue of motivation and reward imported from the open source model, one has to confront the additional problem that the practices and values of peer review may not translate easily into a framework structured by patent law

⁷ Joseph Scott Miller, “Building a Better Bounty: Litigation-Stage Rewards for Defeating Patents,” *Berkeley Technology Law Journal* (2004).

⁸ Exceptions to this pattern are Yochai Benkler’s “Coase’s Penguin, or, Linux and the Nature of the Firm,” *Yale Law Journal* 369 (2002) and his more recent *The Wealth of Networks* (New Haven: Yale university Press, 2006).

and PTO practices that bear few resemblances to either the world of open source or to the other environments traditionally inhabited by peer review.

In its present form, the peer to patent initiative entails nothing less than grafting a bazaar on to a cathedral. Furthermore, it plans to do so through the collaboration of reviewers likely to have divergent interests in reviewing patent applications – not the kind of shared motivations found in open sources environments. Current discussions of the peer to patent project emphasize a commitment to “making a patent stronger,” but how can that notion be separated from that of “killing the patent?” Can an ethos of collaborative production be translated into a project that is essentially about criticism?

Recent assessments of the patent system that have pointed to the problems created by holding on to one-fits-all notions of invention that negate the radical differences between the products of innovation in different fields such as pharmaceutical research and software development.⁹ It would be unwise to reproduce similar problems by treating peer review as something of a “principle” or unified set of practices applicable to all sorts of different scenarios of innovation and decision making. In her “Peer to Patent” proposal, Beth Noveck has indeed addressed the existence of a range of peer review systems by contrasting the practices of federal agencies with those of open source environments, but has ultimately treated them as varieties of the same species.¹⁰ But if one casts a wider net and considers more agencies, disciplines, and practices, and also looks at what peer review means in the academic and scientific publication system, it seems that we

⁹ Brian Kahin, “Patent Reform for a Digital Economy,” White Paper for the Computer & Communications Industry Association, November 2006, pp. 22-3.

¹⁰ Beth Simone Noveck, “Peer to Patent: Collective Intelligence, Open review, and Patent Reform,” *Harvard Journal of Law & Technology* 20 (2006), pp. 138-51.

have no species but only varieties all the way down. The main problem, in my view, is that the notion of “peer” is as difficult to pin down as that of novelty or nonobviousness. Similarly, the ethos associated to peer groups can be as variable as the contents of that wonderfully opaque category called “culture.” In sum, while it makes sense to try to reform patent examination practices by bringing in expertise from the outside, one may not have a lot to gain by conceptualizing this operation as an application of peer review as defined by open source practices and ethos.

- Whose peer?

There is evidence that sometime peers can get too close to be safe. The 1836 Patent Act that established the Patent Office and its bureaucracy also ruled that none of its employees could develop financial interests in the patents they were reviewing. This was a fundamental improvement because, until then, applicants could count on little or no confidentiality. One could argue that the attempts of early modern inventors to file descriptions of their inventions only *after* the grant of the privilege reflected the justified distrust they had not only for competing inventors but also for the clerks who handled their applications or the courtiers who facilitated the granting of the privilege. The 1790 US Patent Act may have reflected some of these concerns when it required the deposit of full, enabling specifications at the time of the grant, not of the application.¹¹ If the 1836 Patent Act introduced a firewall between the role of examiners and that of inventors and entrepreneurs (effectively making the examiner into someone who *was not a*

¹¹ 1790 US Patent Act, Sec. 1, reproduced in Walterscheid, p. 465. The March 1790 Patent Bill contained the same provision.

peer of the applicant) such a separation was introduced in the applicant's interest.

Scientists shared and still share similar concerns. When in 1675 Christiaan Huygens decided to publish a report of his revolutionary watch in the *Philosophical Transactions* – perhaps the first peer-reviewed academic journal – he first sent an anagram of his discovery to the editor, following up with a paper only after he received a letter from the editor acknowledging the receipt of the cipher – a system not unlike the one used by Galileo himself to communicate some of his discoveries to his “peers.” In Huygens' case, he seemed to think that the editor could be as likely to steal or leak his “secret” as any of his other competitors, and wanted a documented timestamp from the journal before disclosing the text – a process that, given the speed of the post, could take months.¹² Similarly, it was not uncommon for scientific practitioners to have doubts about the integrity of scientific academies to which they were entrusting their priority claims through sealed notes to their secretaries.¹³ These problems are still with us. Based on data assembled by the NIH Office of Research Integrity, a recent study of scientific plagiarism in the US has shown that the majority of cases of plagiarism result from peer review of either manuscripts or grant applications.¹⁴

¹² In a related case, Huygens secured a patent before submitting a manuscript about the discovery. He did not do so to avoid producing his own prior art, but rather to have his discovery time-stamped by the state through the patent so that his priority could not be endangered through the publication process. Because of his family's political connections he thought he could trust state officials better than journal editors.

¹³ Rob Iliffe, “‘In the Warehouse’: Privacy, Property, and Priority in the Early Royal Society,” *History of Science* 30 (1992): 29-62.

¹⁴ Alan R. Price, “Cases of Plagiarism Handled by the United States Office of Research Integrity, 1992-2005” *Plagiary* 1 (2006): 1-11. This is not surprising because scientific credit is based as much on priority as on content. Getting access to claims before they get

Both the history and present practice of peer review in science do not conform to the narratives of happy sharing one tends to find in discussions of open source communities. I am not at all saying or thinking that peer review is necessarily corrupt or corrupting or that open source practitioners do not practice what they preach. I rather believe that the fact that no case involving of GPL or GPL-derived licenses appears to have been litigated to judgment (while we have, instead, numerous cases of peer-review-based plagiarism) does not suggest that open source practitioners are remarkably more honest than common scientists, but that they simply inhabit different economies of innovation that hinge on very different notions and modalities of distribution of credit and property.¹⁵ These differences are not even reducible to the mere presence or absence of property in the products or claims being reviewed or produced. After all, the open source model is rooted in the affirmation of copyrights by the author (if only as a means to then grant public licenses to that product), while publication credit in science does not hinge on the author's property rights in his/her text.¹⁶

There is, in sum, no inherent relationship between peer review and either open collaboration or plagiarism. The same can be said about technology. Electronic communication is both blamed for multiplying the opportunities and pace of plagiarism and praised for creating the possibility for electronic scientific publications that sometimes have neither editors or peer reviewers (nor the delays that inevitably accompany the review). But

published or even researched gives the plagiarist a hugely beneficial head start in trying to establish him/herself as the real author of those claims.

¹⁵ Arti Rai, "Open and Collaborative Research: a New Model for Biomedicine," Duke Law School Research Paper no. 61, p.11 (<http://ssrn.com/abstract=574863>, accessed 1/9/2007).

¹⁶ Paradoxically, in these cases plagiarism seems to take place where there are no IPRs, and not to take place where there are IPRs.

while it would be silly to blame technology for plagiarism (something that has been done since the introduction of the printing press), it is problematic to say that electronic publications are rendering peer review obsolete. If particle physicists working in large collaborations post unreviewed articles on free-access servers, it is because those texts have been reviewed in-house by many (possibly hundreds) of colleagues who, given the level of specialization of the field, may represent as substantial percentage of the field itself.¹⁷ In this case, the absence of peer review is not a direct result of the possibility of quick electronic publications, but of the relocation of review elsewhere with the publication process. In other instances, the role of peer review is related to the perceived risks of scientific misconduct in a specific fields. Biomedicine has had the highest frequency of fraud and misconduct and, not surprisingly, is also the field where the workings of peer review are most carefully studied and improved. By contrast, fields where responsibility to the public or to federal funding agencies is less of an issue (or where practitioners incline toward a career in the private sector) tend to be less concerned with peer review, which they probably view as an unnecessary constraint.¹⁸

Underneath field-specific differences, we see that when peer review works it is because it is not fully open and democratic. Typically, the peer who reviews has the opportunity and skills to appropriate what s/he reviews – a possibility that needs to be controlled by adding institutional structures and reducing the openness of the review. In editorial peer review that role is

¹⁷ Mario Biagioli, “Rights or Rewards: Changing Contexts and Definitions of Scientific Authorship,” *Journal of College and University Law* 27 (2000): 99-103

¹⁸ See for instance the different publication patterns of senior academic scientists and postdoctoral fellows in the AFCS project discussed in Arti Rai, “Open and Collaborative Research: anew Model for Biomedicine,” Duke Law School Research Paper no. 61, pp. 21-2 (<http://ssrn.com/abstract=574863>, accessed 1/9/2007).

played by the editor – the person who accepts or rejects the suggestions of the reviewers, maintains firewalls between the reviewer and the reviewed, and helps to keep the reviewers honest by, among other things, being witness to the fact that the reviewer had access to certain manuscripts or grants applications.¹⁹ Analogously, the open source/free software model relies on the role of the maintainer – the person who has the right to approve the patches and distribute modified versions of the collectively produced software – the person who, like the editor, “publishes” the collective work of peers.²⁰ The role of the patent examiner is not unrelated to that of the editor, as it has always been defined as that of someone who, while having the skills to understand an invention, could not become a competitor – a peer – of the applicant (in the same way that a journal editor judges manuscripts but cannot publish them under his/her name).

Even Beth Noveck’s peer-to-patent initiative features something like an editor or a maintainer. The project’s “Use Case Model” introduces the figure of the moderator, which it describes as a “member who has approval authority for content under review on the website. The moderator’s role is narrowly defined as a person who checks postings for obvious policy violations such as spam, copyright violations, or inappropriate content.”²¹ That does not seem to involve a great deal of authority, but a few pages later we see that the moderator is also in charge of accepting or rejecting prior art submitted by peer reviewers in relation to a pending patent application – a

¹⁹ We could say that editors have the ability to confront dishonest reviewers with the unacknowledged “prior art” of their fraudulent publications.

²⁰ Eric Raymond, *The Cathedral and the Bazaar*, “Homesteading the Noosphere,” section on “Ownership and Open Source,” at <http://www.catb.org/~esr/writings/cathedral-bazaar/homesteading/ar01s04.html> (accessed 1/24/2007).

²¹ “Peer to Patent Project – Use Case Model”, 10/20/2006, p. 3.

pretty powerful, editor-like gate-keeping function.²² In this instance, the moderator edits what will be delivered to the next “editor” – the patent examiner.

The salient feature of these examples is not simply to indicate that “somebody has to be in charge,” but rather that, in the case of peer review, the process needs to be managed by someone who is a peer of the reviewer and of the reviewed in some ways but not in others. S/he needs to have comparable skills to those of the reviewer and the reviewed (s/he should be a peer by expertise), but ideally s/he should make a living in ways that would not bring him/her in either alliance or competition with either the reviewer or the reviewed. S/he should not be their peer by socio-professional role. Discussions of peer review, however, tend to rely on a meaning of “peer” that’s quite unspecific and blurs the differences between peer-by-expertise and peer-by-role, as well as between peer as collaborator and peer as competitor. Scientists who operate in an economy of publication credit have learned to trust each other out of need, not love. They trust each other because they cannot not trust each other. They are interdependent because they cannot be independent. Most of them agree to depend on their peers’ assessment because they feel they have no other better source of assessment, no better way to regulate access to resources and rewards.²³

²² *Ibid.*, pp. 12, 14.

²³ Furthermore, peer review is one of those topics that are liable to be represented very differently, according to one’s ideological commitments. It is a bit like gift-exchange: where some see a free and disinterested exchange of gifts and counter-gifts, anthropologists see challenges to conspicuous consumption – almost duels fought by non-bloody means (Marcel Mauss, *The Gift*, (New York: Norton, 1967)). Many narratives about open source resemble the former while empirical studies of editorial or institutionalized peer review are closer in tone to the latter.

- Editorial peer review and patent examination

I believe that editorial peer review provides a better term of comparison for patent peer review than either agency-based or open source review models. An additional advantage to the comparison is that editorial peer review has been and continues to be the subject of much detailed empirical research (an order of magnitude larger than studies of agency-based or open-source-style models). This research has mapped out – mostly through quantitative methods – the various dimensions of peer review as well as many of its problems and biases (cognitive, social, gender, race, etc.). This is a literature that, as far as I can tell, has not been actively included in discussions of peer to patent models.²⁴

The PTO patent examiner can be construed as an editor, while the peer-to-patent participants can be thought of as referees who submit their advisory reports to such an editor. This is particularly appropriate in the current model which construes the peer to patent community as a collective referee who does not review patents for a living but occasionally receives an application to evaluate (the way a scientist would receive a manuscript or a grant proposal) and then sends his/her advisory report back to the editor/examiner without having input in the final decision on whether to issue the patent, publish the article, or award the grant. The analogy carries

²⁴ The literature is too vast to list, but a starting point are the papers at <http://www.nature.com/nature/peerreview/debate/index.html>, and the many references in Tom Jefferson, et al, Effects of Editorial Peer Review,” *JAMA*, June 5, 2002, 2784-86, especially the proceedings, published in *JAMA* of the various international conferences on peer review.

further, as neither the peer patent reviewers nor the reviewers of manuscripts or grant applications are paid for their work.²⁵

It is also becoming common for scientists to list patents as publications. Not only patents are indeed published texts, but they are typically treated as peer reviewed publications because of the review process they have to undergo. The actual review process is also similar for patent applications and manuscripts but quite unlike that of open source collaborations. Patent reviewers and manuscript reviewers *do not help to construct* a product, as instead open source participants do. Their role is (or ought to be) primarily *critical* – to distribute limited funds or limited number of journal pages by narrowing down the number of qualified submissions, or to reject patent applications that do not meet statutory requirements. Their methods are not identical but still comparable, as they involve the comparison of applications and manuscripts with other texts -- prior art or scientific publications.²⁶ Finally, the value of a patent lays more in the future more than in the present, not unlike the way a publication benefits its author through the resources it may help to secure in the future – jobs, fellowships, grants, etc. Because of the review process they undergo, both publications and patents carry an imprimatur of quality that may produce future opportunities (unlike grants that provide, instead, immediate financial awards).

²⁵ The review of book manuscripts for academic presses is only a partial exception. The typical ‘reward’ of 150 or 200 dollars for reviewing a book manuscript is a token gesture, not an actual payment for a couple of days of work. While funding agencies like the NSF compensate the members of grant or fellowship review committees, that does not represent a payment for their work but rather a reimbursement for their travel expenses.

²⁶ The way patent claims and scientific claims are constructed is, however, remarkably different, as analyzed in Greg Myers, “From Discovery to Invention: The Writing and Rewriting of Two Patents.” *Social Studies of Science* 25 (1995): 57-105.

We can use these analogies as a backdrop to an analysis of the differences between the two kinds of review and the problems behind them. The first is that, paradoxically, the review turns out to be weaker where the stakes are higher. The current ex-parte patent examination is less extensive and probably less intensive than that of manuscript or grant applications submitted to journals or federal funding agencies, despite the fact that the former grants something that is substantially more powerful than what is provided by the latter. The PTO does not simply grant *resources* (funds or publication space), but powerful *exclusionary rights*. Any time an examiner lets through claims that are not fully novel and nonobvious, a monopoly is created on something that already belonged to the public. By contrast, the worst thing that can happen when editorial peer review fails is that some space in a privately owned journal gets misused or simply not optimally used. Furthermore, if a scientist receives a grant from a federal funding agency, s/he is required to use those resources and deliver something close to the goal listed in the application. The award of a patent, instead, does not require the patent-holder to do anything with it. S/he may even chose to wait to be infringed.²⁷

At least in principle, patent examination should be less contentious than the review of manuscript articles. Grants or manuscripts review has a conservative bias when it comes to assessing substantially new directions and claims because, in the context of that kind of review, the acceptance of the manuscript or grant proposal automatically implies some degree of *endorsement* of the new claims by allocating resources to them. But in the

²⁷ Markus Reitzig, Joachim Henkel, Christopher Heath, “On Sharks, Trolls, and Other Patent Animals: ‘Being Infringed’ as a Normatively Induced Innovation Exploitation Strategy,” at <http://ssrn.com/abstract=885914>.

case of the patent, novelty and nonobviousness need simply to be *recognized*, not endorsed. It is up to the patentee to mobilize resources around the patent.

That potential advantage, however, does not translate in good patent reviews. For one, the gap in expertise between the patent examiner and the inventor likely to be higher than that between an author and the reviewer of his/her manuscript. It could actually happen that while the inventor knows more the examiner, the author of a manuscript might be less competent than his/her reviewer. Similarly, journal editors tend to be senior practitioners with broad knowledge of the field and its players, but patent examiners may be instead junior practitioners with limited or no direct research experience. As their prior art searches privileges patent databases over scientific literature, they may also lack the big picture of the research field. In addition, the PTO does not seem as discriminating in giving out patents as the editor of *Nature* or *Science* are in allocating precious space in their journals. While editors need to maintain or improve the impact factor of their journals – an index based on the number of citations per article, not on the sheer number of published articles – the PTO benefits from maintenance fees of the patents it grants.²⁸ Furthermore, the standards of editorial review do not seem weakened by the competition for top articles among various journals – a competition that yields prompt rather than easy publication. By contrast, the PTO holds a complete “monopoly” on the grant of patents. But while patent applicants do not have the option of shopping around other patent offices, the PTO review standards are not made any stricter by that.

²⁸ Brian Kahin, “Patent Reform for a Digital Economy,” p. 11.

- Peer issues in the peer-to-patent initiative

In its current incarnation, the peer to patent initiative is cast as a self-contained graft on the standard patent examination process. It's up to the applicant to decide whether to submit the application to peer review, and it is up to the patent examiner to accept or reject the evidence and comments provided by the peer to patent community. Given its voluntary and "added on" nature, it would seem unlikely that the pilot program starting in the next few months will generate serious tensions between the knowledge and interests of the voluntary peer reviewers and the institutional culture of the PTO. A more worrisome scenario would be one in which the reviewers fail to be motivated enough to collaborate, especially given the fact that the rewards currently envisioned will be of a non-monetary nature. The organizers' efforts seem to be appropriately focuses on enticing people to collaborate, also by allowing them to operate pseudonymously so as to reduce whatever liabilities (real or imagined) they may worry about.²⁹

Things could get more complicated, but also more interesting, if the logic of the peer to patent initiative were to be actually incorporated into PTO practice through an institutional reform. Based on the analogies between patent review and editorial peer review that I have sketched out above, one possibility would be to redefine the patent examiner not as an expert fact-finder and evaluator, but rather as an editor-like figure. The examiner would still be in charge of the communication with the applicant and of deciding the fate of the application, but would be obliged to do that by relying on the reports and evidence provided by the external peer

²⁹ Beth Noveck, personal communication, 1/20/2007.

reviewers – inputs that s/he could weigh in the same ways editors do. The examiner should also be allowed to request reviews from specific individuals if s/he thinks it necessary, as in the case in which voluntary peer reviewers may not be independently motivated to comment on an application. Such an arrangement would allow for a stronger alignment between patents and the knowledge of the community – the kind of alignment envisioned by the March 1790 Patent Bill but never accomplished because of the lack of a suitable communication infrastructure.

It is quite possible that conflict of interest will sometime emerge between the applicant and the peer reviewers. That happens in academic peer review as well, typically around manuscripts submitted by academic scientists based on research sponsored by the pharmaceutical industry. But the standard guidelines on conflict of interest adopted by hundreds of scientific journals show that editors have got much better at mapping and controlling the problem.³⁰ Like any journal editor, the examiner would be responsible for the accurate disclosure of the reviewer's conflict of interests and, if that appeared to be substantial, refer it to an appropriate PTO official. The reviewers would not be liable for their unintentional errors or limited knowledge, but only for fraudulent statements and evidence. Concerning the blindness or openness of the review, or the applicant's access to the reviewer's name, the public availability of the review, the PTO could follow the peer review practices of other federal granting agencies.

The reward of the peer reviewers is a more complicated matter. Those who review proposals and manuscripts do so for free largely because they recognize a degree of interdependence among the practitioners of a

³⁰ ICMJE, "Uniform Requirements for Manuscripts Submitted to Biomedical Journals," February 2006 version, www.icmje.org.

given field. I review your manuscript because when I submit a manuscript myself I expect the journal to find somebody to review it. Given that the article does not create exclusive property rights for the author, reviewers might feel that they do not need to be rewarded either.³¹ But it would be quite different to collaborate in a review process that may end up granting IPRs to the applicant – rights s/he might be able to translate into substantial financial benefits or perhaps into obstacles to the reviewer’s research.

The reviewer is not likely to perceive a patent applicant as a colleague, despite the fact that they might share much of the same expertise. Even if they were members of the same sub-discipline, the presence of IPRs (granted by the government, not by the scientific community) would change their relation, at least within that specific context. Furthermore, if reviewers contribute to protect the public from dangerous (and ultimately illegal) monopolies on non-novel and obvious inventions, they should be entitled to rewards. As the examiners’ workload would be reduced by farming out prior art searches to external reviewers, part of the filing fees could be rerouted to those same reviewers. How to distribute the bounty over possibly several reviewers? Their names would be known to the examiner, so tracking them down should not be a problem. If rewards for reviewer are kept modest and comparable to those of a book manuscript review (around \$200), the examiner could simply assign them to the four or five most useful contribution to the review. If the amounts are small, their distribution is not likely to become a contentious issue.

³¹ The author, of course, holds the copyright in the article, but that has virtually no impact on the other researchers who can use (with appropriate attribution) any claim contained in the article. It is also quite unlikely for the author to make money from copyrights in a research article.

This brief sketch is proposed only as a way to start a conversation. And yet I find it interesting that the analogies between patent review and editorial peer review suggest that the peer-to-patent system could be simpler if actually brought inside the walls of the PTO rather than tenuously grafted on it. Much of the fine work done by Noveck and her collaborators to hammer out the details of the peer to patent model has gone into the articulation of mechanisms of collective management and reward. The assumption that this project would have to operate according to open source ethos and sociability is quite appropriate if one conceives of this initiative in terms of a body of experts who work virtually independently from the PTO, simply communicating the results of their collective review to it. This is perhaps the only viable conceptualization for a pilot program to be tested while keeping PTO's examination practices essentially unchanged.

At the same time, if one takes the next step and tries to envision how peer review could become part of PTO practices, many or most of the complicated problems related to the project's collective governance and reward would be likely to either diminish or disappear. It is the current near-complete externality of the peer to patent initiative from PTO institutional practices that makes it natural to conceive of it as an "open source" project. That might be more a sign of its relative marginality than a formula for success. But if we start to think about a possible patent reform that would secure a better alignment of knowledge and patents, then the place of peer review would most likely be inside the PTO and editorial peer review would provide, I think, a more useful model for articulating such a transformation.