

Editorial:

Why deciding to publish in *Poudres & Grains* : Towards a more efficient politics of scientific evaluation.

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Abstract:

The classical scientific peer-reviewed Journals :Do they make the scientists' work simple to evaluate? Are they bound to vanish, or to change? This explains why to publish in Poudres & Grains.

Translated by Henri-Thierry TOUTOUNJI

Scientific reviews are tools created by scientists, in order to insure the exchange and the perpetuation of their work's results. It is therefore essential to analyse (A) the way the scientists use these reviews and to study (B) how these reviews operate, in order to establish a research evaluation policy. We will also wonder (C), whether the publishing process can be improved or not.

A) Usage of scientific reviews:

At first, scientific reviews were created to insure a quick circulation of the information, while guarantying a low-cost, good publishing quality. Furthermore, it was considered that published articles contained potential mistakes, and they were submitted for debate. That is proved by the scientific work standards, which have always made critical bibliographic studies compulsory before any scientific research. These studies consist in summing up the subject, by using, among other means, the scientific reviews. The scientist will thus seek articles related to his research topic, and will try to discriminate between "true", innovative articles and "true" but uninteresting, or even partially incorrect, or totally wrong articles

This first step in the research process is therefore a value judgment: it is an essential step in the process. This method is the only one accepted by the researchers to evaluate their work, and others' work. It has to be the prevailing method in the evaluation committees. Otherwise, the definition of new criteria will change the way researchers work.

This phenomenon is already at work and can be indeed observed: the research evaluation committees content themselves with studying the statistics of the number of publications, or the quotation rate, *etc.* As for the researcher, he contents with taking care of his personal publicity: he travels from congress to congress, to talk; and he

leaves right afterwards, without listening. Is that a serious communication policy? To my mind, I think the figures can help to evaluate, but do not allow a serious evaluation, for the reasons I have stated in the two previous paragraphs. This method could indeed incite young (or older) researchers to neglect their bibliographic work.

As for the National Science Foundation (NSF) (and also other national or international organisms) it does not content itself with counting the publications. On the contrary, it appoints independent international experts to evaluate the teams or the projects it finances.

Finally, given that the research stands very closer to university education, we must be on our guards against the example we give, and we therefore must make an effort concerning our rigor.

B) How do the scientific reviews work?

Before addressing the definition of the purpose of the scientific evaluation, I would like to precise the different steps of the scientific production and to define (i) my view of a scientific article, (ii) what would allow it to get published, (iii) the difficulties faced by some innovative articles, or (iv) by articles dealing with subjects located at the crossroads of several scientific domains. I will then describe how the readers' comity reviews work and are constituted, as well as the influence they have in the scientific community. I will finally examine their drawbacks, while keeping in mind that their primal role (distribution of the scientific knowledge) is more or less ensured.

- (i) A research article tries to further a subject, by examining a new, precise example, and to propose new answers. In this aspect, there is a risk of error.
- (ii) An article that manages to be accepted by a Review has a content that meets the Referees' expectations. It therefore addresses a question that is important to the Referees' mind, and it defends a point of view that is close to the Referees'.
- (iii) Consequently, the more innovative is an article the less chances it has to be accepted by a review. In some cases, the articles were so innovative that new reviews were created to publish them. Furthermore, innovative articles that manage to get published can be totally wrong, given that the referees don't have the adequate evaluation criteria.
- (iv) Pluri-disciplinary articles face the same problems. An article that refers to several scientific disciplines and concepts, though it is necessary, could shock some referees' sensibility, if they are specialized in a precise domain, and could be therefore rejected; not to mention that the chance of mistaking is higher, and out of control of over-specialized referees.
- (v) Let's study now the way a scientific review works. A readers' comity review is built around several scientists who represent a precise school of thought. The existence of several reviews focused on the same subjects shows the reality of these schools of thought, as well as the lobbies associated. It is therefore understandable that these reviews try to take more and more importance in the financing of the research programs and the evaluation of the searchers' work.

This represents a real danger. The readers' committees are in fact the remains of the last academic Establishments.

- (vi) Can we see in the concurrence between the reviews a cause of their incapacity of limiting their scientific production? The number of scientific publications is indeed in constant raise. Furthermore, the reviews are unable to control neither repetition nor plagiarism, and aren't much concerned by the observance of the right of anteriority. Moreover, they do not actually filter anything, given that only a little percentage of the scientific production is never published.
- (vii) Finally, this type of publication is expensive, much more expensive than a web-based scientific review. It considers information as a good and a power that can be sold and bought, where the author pays for the right to be published, where the reader buy his reading, and where the author and the reporter work for free. Why do they do that? Probably because they hope to show that their work meets recognition, to enjoy some publicity and to get financial support. Is that a guarantee of the quality of their work? That would require that the Reviews follow through their judgments, because scientific judgments are a long-term business.

In fact, if a review is addressing any potential reader, the authors who write in those reviews correspond, on the contrary, to a restrained proportion of the scientific community of the concerned discipline. Indeed, the other authors will choose to publish their work elsewhere, because of referees' problems. This shows the existence of a "publishing power" that do not has his place here, because it is in contradiction with the scientific deontology and the free circulation of thoughts.

Finally, we cannot and must not consider that the scientific reviews are sufficient to insure the archiving process of all the scientific information. These reviews consist in commercial firms, which can face bankruptcy, they do not have the same priority specialized organisms have (Library of Congress, National French Library, *etc.*). The best guarantee these reviews offer is the distribution of the information, as well as its storage in several places.

C) Toward an improvement of the publishing process and of the evaluation

In order to improve the publishing process, we must compare the rules presented in the previous paragraphs, with the ones imposed by the scientific deontology. This deontology calls for a free circulation of thoughts, a free debate, and suggests that each one should make his own opinion. On the one hand, the spreading of a wrong way of thinking, or of a false result is not, itself, a danger, because the scientific methodology allows us to detect them. That's the reason why scientific reviews were able to resist. We only have to watch out for such intentional acts. That means that the debates must be loyal and that the results proposed have to be honestly described, *etc.* On the other hand, pure authority acts, like the simple rejection of a thesis, must be banned. We must as well protect the author's rights, the right of anteriority, and also the right of withdrawal, *etc.*

People have already tried to improve the publishing process in the past. For example, some people tried to allow the debate about a specific article during a specific period of time. Unfortunately, this was too expensive, and made the publishing process too complex. After the birth of the internet, of the web-based publications, and of the good quality printers, the cards have changed. The distribution of the information is quick and cheap. Furthermore, the interactive footnotes are easy to operate, so that any problem's follow-up, any evaluation's follow-up can be done on the long term. All that needs to be done is to define a storage protocol, and to insure its durability on long periods (15 to 20 years). Beyond this period, no durability will be necessary, because a research axis doesn't live up that long: it is the consequence of the generation pass-over.

Example of a recent application:

This type of experience is presently under trial with '*Poudres & Grains*'; we have made this review accessible on the Internet: <http://prunier.mss.ecp.fr/poudres&grains/poudres-index.htm>, while keeping a paper archive in the National French Library. The publishing rules are quite simple, and are exposed in the annex document. They abide by the scientific deontology: free access for all, respect for anteriority, banishment of personal quarrels, acceptance of all debates and all scientific disputing. Furthermore, it is stipulated that every reader must act as a referee, and that every author has to make an honest description of his results. These rules will allow a better efficiency in the transmission and the evaluation of the results and theories. For example, a pluridisciplinary article will be judged by readers with knowledge in different domains; everyone will be allowed to express himself in his own discipline, and everyone will have access to the remarks of the other specialists. This will allow the transmission of knowledge from discipline to discipline. The readers will replace the readers' comity; a referee/author/reader who makes a mistake will eventually find it out; finally, it is easy to respect the principle of anteriority, and to prevent repetition, by simply annotating: "already read, reference, name of the person who wrote the remark". Furthermore, the article is submitted to the online review as is, without any possibility of modification, of recasting; the readers' advices, only confirm the work's quality.

To avoid the danger of polemical overflow, every article has to be signed, and the authors must be professionals in the research or teaching department.

This publishing presently seems to bother the potential redactors who maybe fear that the articles they publish online on "*Poudres et Grains*" will not be counted by the Commissions. This problem will probably disappear gradually, unless there is a systematic refusal of publishing in these kinds of reviews.

D) Toward a stronger respect of the scientific deontology

The following paragraphs will give a few examples of the potential problems linked with the traditional publishing policy.

What should an editor do when one of his referee states “we must refuse this article, because the results are right, but well known” and another one states “this article mustn’t be published because the results are false”? Of course, the editor will refuse the article, though one of the two referees is wrong, and though their disaccord calls for questioning...

Why are some articles rejected by a review and accepted by another?

How should we consider an editor that refuses anteriority?

What can be said about referees who systematically refuse articles that contest their review’s thesis?

What is there to say about a review that refuses to publish a bibliographical research which links different results, and unifies concepts from different domains?

What is there to say about a review that demands huge appendixes instead of specialized references?

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All these facts are serious breaches of the scientific deontology as well as of the rights of the authors. In the present scientific reviews, nothing is done to prevent these, or to improve the publishing system, or even to state clear statistics about these breaches. Even when an internal control organism exists, it has little or no efficiency. This shows how reader’s comity reviews do not follow the scientific deontology, and this applies to the greatest physics’ reviews: *Nature*, *Science*, *Phys. Rev. Lett.* , *European physics J*, etc. .

In France, no specific commission has been appointed to deal with these breaches of the scientific deontology, or to help any potential infringed party. We must keep in mind that “Science, without a conscience ruins the soul”. The scientific research must, at all costs, create organisms that would watch for its ethic, or else the scientific community will disappear, corrupted by money, power, clans, and advertisements.

Is this reform impossible? The French CNRS has appointed an “Ethic commission”, that doesn’t have, for now, any power or any link with the legal institutions, etc. .

Are the new technologies going to bury the traditional types of publishing? I hope so, because this would speed up the distribution, as well as the reviewing process, while keeping a low editing cost. However, this will require a reshape of the way of thinking of all the research protagonists, as well as it will require deep changes in the financing process of the research managing institutions. At present time, these institutions seem to refuse such changes, which is understandable because they would loose power. This may be the reason why the traditional publishing companies try to impose new methods for the evaluation of searchers. They also try to make us believe that these methods follow a scientific deontology. That may be also the reason why these companies constantly raise their scientific production.

That may be, once again, the reason why “*Poudres et Grains*” has been recently criticized. Why in the world would they want to restrain the free circulation of ideas? In the name of what? What’s wrong with an author who publishes in a review that has a delayed readers’ comity or doesn’t have any readers’ comity at all? If we are not careful enough, we could face serious troubles. Could the traditional publishing comities be today’s Inquisition? We should just allow new experiences, experience new means of communication. In these times of intense innovation in the scientific communication domain, this experimental field must remain free. Moreover, the evaluation processes must be strengthened and the necessity of reading and listening mustn’t be forgotten.

Annex :

Objet de la publication *poudres & grains*

poudres & grains est une revue publiant des articles scientifiques originaux dont le sujet traite des matériaux en grains, en poudre ou assimilés; elle est couverte par le copyright. Elle s'adresse à des professionnels de la recherche et de l'enseignement des secteurs public et privé. Chaque numéro a une version imprimée conservée à la Bibliothèque de France. La reproduction intégrale des articles et/ou de la revue pour des usages personnels ou afin d'archivage est autorisé et peut se faire par téléchargement. Une autorisation doit être demandée pour des reproductions même partielles.

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Règles éditoriales:

Tout auteur scientifique doit

- Décrire honnêtement les résultats qu'il a obtenus tant théoriques qu'expérimentaux.
- Accepter et favoriser le débat honnête entre scientifiques.
- Ne pas faire de querelles de personne.
- Respecter les droits des autres auteurs scientifiques et de l'antériorité scientifique en particulier.

Tout manquement à ces règles supprime l'accès à la publication. L'auteur est seul responsable du contenu de l'article. Une commission éditoriale donne son avis au besoin; mais le vrai travail de rapporteur doit être exécuté a posteriori après publication, par la communauté scientifique.

Tout lecteur scientifique doit

- Faire une analyse critique des articles scientifiques qu'il lit de manière à se forger sa propre opinion
- A la suite d'une lecture scientifique, porter à la connaissance des lecteurs scientifiques des résultats faisant partie du domaine public et exprimant les mêmes résultats ou des résultats contraires à ceux qu'il vient de lire.