Evolution of *Sci*'s Community-Driven Post-Publication Peer-Review

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Since the 1990s, scientific communication has witnessed considerable transformation, driven by the advent of technologies such as web-based publishing, online-conferences, globalization of the scientific community, a dramatic increase in scientific output, and, in some aspects, also a changing self-conception of science and scientists. Today, the dissemination of scientific ideas is as important as finding and testing them in the first instance. As philosophers would say, dissemination has become the ultimate step in the traditional chain of scientific discovery. Within this context, publishing has become more central, echoing both the banal "publish or perish" and the tree that has—or has not—fallen in the woods of Berkeley [1].

The developments witnessed in publishing during last two decades are truly revolutionary and have even changed the way science is conducted. Modern web-based publishing in Open Access journals, for instance, enables colleagues to submit and access freely millions of scientific manuscripts from across the globe and around the clock. This has broken down traditional borders—geographical, economic, cultural, and otherwise. Moreover, this freedom of scientific exchange creates global and equal opportunities, and helps to substantially decrease the costs of scientific publishing.

At the same time, over the past decade there has been an explosion in the number of journals and also in submissions, pushing the entire peer-review process close to collapse. The various attempts—or lack of attempts—to filter and channel submissions and online publications has resulted in often superficial and subjective peer-reviewing, and high rejections rates for arguably good papers. The claim that "we assume that the referee has not read our manuscript properly or at all" has turned from a rather curious anecdote to a bitter truth. As a result, "scientometric parameters" have been introduced to somehow rank science and scientists, pretending to quantify the unmeasurable, to the despair of any decent philosopher of science [2].

Professional dissemination does not come for free, and the traditional "exclusiveness of the readership" based on subscription charges has slowly but steadily given way to an equally, perhaps even more problematic "exclusiveness of the authorship" with sometimes truly astronomical Article Processing Charges (APCs) [3]. For some colleagues, the problem has shifted from not being able to read a published article, to not being able to cover the costs for publishing their own work. In the former case, the manuscript in question and the science it contains are at least placed on record.

Today, these issues of scientific dissemination confront a volatile scientific community, unsettled by financial constraints, bogus journals, inappropriate refereeing, impact factors, and Hirsch indexes. From their perspective, publishing should at least be non-discriminatory with regard to their finances. The review process should be open, transparent, fair, and—above all—thorough and professional and should also maintain the originality of the authors and not turn into an effort to placate the referees. Simultaneously, reviewers should also not go unnoticed, and their time and efforts should be

rewarded. Their reviews should be open for approval and critique, preventing subjective or otherwise "nasty" comments.

In this situation, a "*Gedankenexperiment*" may be appropriate. Consider the demands of modern science and scientists on the one side, and the enormous possibilities—and constraints—of modern-day publishing on the other. Almost inevitably, a publishing strategy for the future emerges. It relies on some proven practices, such as Open Access, yet further revolutionizes and, in many aspects, also democratizes the publishing process.

The journal *Sci*, launched in 2018, aims to convert some of these ideas into sustainable publishing practices [4]. A recent meeting between MDPI and the epistemological unit of Pharmasophy at Saarland University who runs the academic "Purple Publishing" research project (http://sci.fo/5v8) highlighted many common objectives. Therefore we decided to work together to evolve *Sci* further to apply new ways by which Science can be more efficiently evaluated by the communities, better communicated and serve correctly the interests of the scientific communities.

As part of this philosophy, any manuscript—just like a composition by Mozart—is seen as an original piece of scientific writing which reflects not only the data, but also the individual interpretation of the authors. Such a piece is valuable and should not be rejected, and thus prevented from dissemination, by just two or a few reviewers. In the current traditional peer-review process, the few invited experts often have little time or interest in their task and may have been instructed to aim at a high rejection rate to keep impact factors high and page numbers low. Such a manuscript should, instead, become widely seen and scrutinized openly by the entire scientific community—or at least by the members of the community with a genuine interest and expertise in the manuscript and its content. In agreement with modern theories of science, the community and its subsequent actions—not just a couple of "undisclosed experts"—would then decide if the manuscript and its content are truly scientifically sound, important, timely, significant, and of value to further stimulate research and innovation.

Such an approach necessarily requires publication of any decent manuscript a priori, i.e., after it has been submitted by the authors and checked briefly for form, plagiarism, language, and non-offensive content, yet before it is reviewed in the traditional sense. In practice, publication before refereeing is technically possible and, apart from avoiding the rejection of potentially valuable science, has several additional benefits. It places the manuscript on record, ensures that all pieces of science become available, protects the originality and precedence of the authors, and initiates an open and transparent reviewing and revision process a posteriori. The reviewing itself commences after publication of the initial version and by any colleague interested in commenting. *Sci* will implement a "scientific market place" style of reviewing, in an open and transparent way where the number of volunteer and qualified reviews is not limited, and, within a realistic timeframe, the authors will be able to consider these reviews and carry out revisions. Interestingly, reviewers will also no longer go unnoticed—their reviews will be shared and approved/endorsed by others. As part of this open, transparent, global and democratic review process, emerging scientists in particular, will be able to become involved. Through this process, they can earn respect within their respective community as highly regarded reviewers.

As always, innovative ideas, such as publishing original manuscripts a priori and reviewing openly and *a posteriori*, will face some criticism. Proper implementation requires continuous refinement and development, taking on board constructive feedback. Nonetheless, this approach towards reviewing and publishing generates a global playing-field of equal opportunities, where traditional scientometric parameters such as impact factors and Hirsch indexes are no longer needed.

In *Sci*, each manuscript receives its individual rating by the community, which is distinct from the rating of the journal. Similarly, the standing of the authors will depend on their association with their highly rated manuscripts and not on their ability to publish in high impact journals. Reviewers will also be esteemed by the scientific community for their excellent reviews within a

comprehensive and transparent rewarding system, a 'thank you' which has long been demanded by the scientific community.

Indeed, transparency and accountability will be achieved easily by the employment of state-of-the-art technological solutions, such as *Sciprofile*, a tool to identify and authenticate authors and reviewers and to avoid fake profiles and authors. Furthermore, reviews and ratings, comments and replies will be fully transparent, for the benefit of authors, reviewers, readers and the progress of good science.

We are very excited to present how we foresee the evolution of the journal *Sci*, and to share it with you. We sincerely hope that this approach will attract your attention, interest and, above all, approval. We are looking forward to your submissions, comments on posted manuscripts, and any other feedback you may wish to share with us, either a priori or a posteriori.

Conflicts of Interest: The authors declare no conflict of interest.

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