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OPENING UP THE HISTORY OF SCIENCE: A PERSPECTIVE FROM *CENTAURUS*

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ABSTRACT – Centaurus was founded in 1950 and has remained so far one of the major generalist journals devoted to the study of the history of science. Since 2007, it has been the official journal of the European Society for the History of Science (ESHS), which in 2022 became its co-owner. In the last decade, *Centaurus*' mission has increasingly been aligned with the ESHS's purpose to promote cooperation in the field of the history of science understood in the broadest sense, in and beyond Europe. As a result of these efforts, *Centaurus* became a 'diamond' Open Access journal, in which authors can publish without any cost and readers can access all the content for free. Open Access will come with new benefits and new responsibilities, especially for a small humanities field such as the history of science. Transitioning to Open Access is a big challenge and a remarkable change for a journal. The first part of this article discusses recent developments in Open Access within their social, economic and political context, taking *Centaurus* as a case-study. However, Open Access is only the start of a more thorough transition to Open Science practices. The second part of this text focuses on Open-Peer Review, a new process aimed at

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overcoming the well-known drawbacks of blind peer-review, to open up a discussion about its advantages and disadvantages for the history of science.

INTRODUCTION

This article discusses recent developments in the field of history of science based on my experience as a researcher, science advisor, member of the ESHS Council and editor of *Centaurus*. Since every journal is different, and since the specific trajectory of *Centaurus* determines my experiences as an editor, it is useful to briefly review the journal's history. *Centaurus* was founded in 1950 and has remained one of the major generalist journals devoted to the study of the history of science. Since its inception, the scope of the journal has varied, depending on its changing institutional associations, from the history of science and medicine in the 1950s to the history of mathematics, science, and technology in the 1970s. While the journal had a 'continental' and technical reputation in the 1990s, subsequent editors have broadened and diversified its scope.¹ Since 2007, *Centaurus* has been the official journal of the *European Society for the History of Science* (ESHS). When I started as editor in 2018, it became clear that the journal needed to operate in even closer cooperation with the ESHS. I am delighted to announce that the ESHS became co-owner of the journal (from 2022 onward), for the first time bringing academic and administrative control of the journal in the hands of the history of science community. I also aligned *Centaurus'* mission with the ESHS's purpose to

¹ See VERMEIR, 2020a, for a witness account of the history of *Centaurus* and its editorship in the last two decades. For *Centaurus* in the 1990s, see the review by Victor Thoren, who writes that "Centaurus is a Continental journal." He continues: "the result is still articles that are mostly timeless and present the methods, concerns, and views of the Continental community in a way that is very useful for Anglo-American scholars. As a general record of developments in the entire discipline, it is fully equivalent to *Isis* and the *British Journal for the History of Science*," THOREN, 1991.

promote cooperation in the field of the history of science understood in the broadest sense, in and beyond Europe, and I have further opened-up the thematic scope of *Centaurus*.

It is *Centaurus*' aim to publish the best work in the history of science and to represent the diversity of current scholarship. As such, in my role as an editor, I am agnostic about the latest fashions, trends and methodologies: we do not favor one or another approach but select and support work that corresponds to the highest standards of scholarship as assessed through a double blind review process. The *Centaurus* team also aspires to improve current standards through a constructive editorial attitude and a mentoring program. Indeed, we aim at strengthening the field of history of science by delivering the best possible service to authors and readers, by supporting further institutionalization of the field, by taking a proactive stance in publishing innovation, and by reflecting about the future of publishing in history of science. As a result of these efforts, we are proud to announce that in 2022 *Centaurus* became a 'diamond' Open Access journal, that is, authors can publish with *Centaurus* without any cost and readers can access all the content for free. This is also the context that shapes my perspective as an editor and the contents of this article: instead of discussing recent historiographical trends, I believe that it is more important to elucidate the changing social context in which historians of science are working, ranging from publishing revolutions to institutional challenges and even war, which will determine the future of our field.

OPEN ACCESS

From the perspective of an editor of an international journal, the most important development in the last decades is without a doubt the Open Science movement. By now, most of our colleagues in the history of science will have some familiarity with Open Access, which is a cornerstone of Open Science. Open Access is only one aspect of this larger movement,

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however, which, seen as a whole, may have much more impact on our field. Various definitions of Open Science have been proposed but it has most usefully been characterized as an umbrella concept that brings together different initiatives to open up science, including but not limited to Open Data, Open Research Software, Open Notebooks, Open Peer Review and Open Collaboration.² Open Science is not only concerned with how the final product of a researcher's work will be published but touches upon every aspect of academic practice. Furthermore, while I am writing this short article, policy discussions are underway to make Open Science practices the central tenet in the evaluation of researchers. The history of science community thus needs to reflect about what Open Science means for its journals and for the field as a whole. In this section, I will first address Open Access, as this is currently one of the most pressing challenges for the discipline; in the next section, I will touch upon other dimensions of Open Science and the role it may play in research evaluation.

Open Access has been high on the agenda for *Centaurus* in the last five years. There is a personal aspect to this as, coincidentally, I was invited to advise the European Commission on Open Science and to take up the editorship of *Centaurus* almost simultaneously in the early spring of 2018. Indeed, the challenge of making *Centaurus* Open Access, despite the seemingly insurmountable obstacles, was one of the reasons for me to accept the editorship. I was also convinced that Open Access is essential to realize *Centaurus*' mission to promote cooperation in the history of science in Europe and beyond. This mission comprises the emancipatory undertaking to be more visible in and publish more from typically underrepresented regions. This undertaking is especially challenging because the field knows a very uneven institutionalization in different countries and historians of science typically work in very different circumstances in a wide array of institutional settings. Because they work often

² For an overview of elements of Open Science, see GOWNARIS, VERMEIR, BITTNER et.al., 2022. See also the new UNESCO Recommendation on Open Science:

<https://unesdoc.unesco.org/ark:/48223/pf0000379949.locale=en>

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relatively isolated in a department not primarily concerned with the history of science, they cannot garner the support to pay high subscription rates and consequently have no access to even the most important journals of the discipline. Given the current disparities and the difficult institutional conditions for historians of science in most countries, *Centaurus* can only truly become a place of disciplinary and interdisciplinary exchange if everyone, also those from less affluent regions or from places where history of science is not well institutionalized, has free access as reader and author.

Every journal is different: it has a different history and different aims and values, but I think lessons are to be learned from the way in which *Centaurus* made the jump to a diamond Open Access journal. Furthermore, historians of science should understand current dynamics in the publishing industry as these are shaping the practice of science and will affect all researchers in the coming decades and as such, it concerns each member of the research community. Open Access will come with new benefits and new responsibilities, especially for a small humanities field such as the history of science, and I believe that it will not be possible to make the transition to Open Science without the broad support of the community. *Centaurus'* recent history is also a plot with many unexpected twists and turns, which are in themselves worthy to be recorded.

When *Centaurus* started in 1950, academic publishing was very different from what it is today. Founded by a group of Danish historians of science and medicine, it was initially published by the Copenhagen publishing house Ejnar Munksgaard but would soon be affected by waves of big acquisitions in the publishing industry. First acquired by Blackwell it would find a new home with Wiley in 2007, which is currently one of the “Big Three” scientific publishers, together with Elsevier and Springer-Nature. While this offered some benefits, e.g. in professionalizing the workflow or widening the subscription base, it also created tensions

with the scientific community.³ While *Centaurus* became the official journal of the ESHS in 2007, the society has had no say in any decision related to the journal, for instance. Furthermore, the history of science community became increasingly sensitive to the often discussed financial practices of the big academic publishers (who are accused to charge inordinate subscription rates and make huge profits mostly on taxpayer's money),⁴ and colleagues occasionally asked me why *Centaurus* stayed with Wiley. But Wiley *owned Centaurus*.

My initial focus was on change within the system. Wiley representatives responded to my queries that they were supportive of and are actively engaging with Open Access, but it seems that they only considered author-pays Open Access, which they thought inappropriate for *Centaurus* as they did not want to alienate researchers who may not have access to funding. This was an important and valid point, especially for a humanities journal. A breakthrough happened when Wiley announced the “DEAL” at the 2019 Academic Publishing in Europe conference (where coincidentally, and with hindsight somewhat ironically, I spoke about Open Access and researchers' needs). This DEAL is a multi-million € agreement with German universities that German scholars could publish Open Access in Wiley journals for free (some conditions apply).⁵ During the meeting Wiley Vice President Judy Verses laid out the vision that “researchers are our North Star and supporting their needs is what is most important.” Wiley also promised that more of these Open Access “Transitional Agreements” were coming soon. Indeed, by now, the Netherlands, Austria, Norway, Hungary, Sweden, Finland, the UK, Italy, Ireland, Spain and Switzerland have reached similar ‘deals’ with Wiley. On the one hand,

³ In 2017, 12.577 institutions had access to *Centaurus* through Wiley ‘packages,’ traditional subscription or philanthropy (Wiley offers free or low cost access to low-income countries).

⁴ Rising subscriptions prompted for instance Harvard University to declare in 2012 that it cannot afford journal publishers' prices, see SAMPLE, 2012. Over the last two decades, the “Big Three” scientific publishers became billion-dollar companies with profit margins higher than Apple or Google. See e.g. BURANYI 2017.

⁵ A crucial innovation was that the deal was transparent and the contract can be consulted here: <https://www.projekt-deal.de/wiley-contract/>

this has clearly benefitted *Centaurus* as the journal published 23 and 16 Open Access articles, in 2020 and 2021 respectively, funded by such ‘deals.’ On the other hand, these “deals” create more inequality in Europe, giving preferential treatment to authors and readers from specific countries, which goes against *Centaurus*’ mission. The ESHS and I thus started to explore new opportunities, and given Wiley’s iron grip on *Centaurus* at the time, this included discussions with other publishers.

Centaurus’ focus on Open Access did not develop in a void but we responded to changes in the publishing industry, perceptions in the community and mounting pressure from politicians and policy makers. Indeed, humanities and social science journals are under pressure due to seismic shifts in the academic publishing business. Because of Open Access challenges and new opportunities, e.g. in data management and researcher evaluation, big publishers are reorienting towards new business models. Wiley hired new management because of experience in ‘market disruption,’ for instance, and Elsevier brands itself now as an “Information Analytics Business,” not a publisher. Similar to Google and Facebook, some publishing companies are turning researchers from customers into products.⁶ As a side effect of these large shifts, however, high cost journals with low profitability and little potential for monetization in gold Open Access may be discontinued by the publisher, irrespective of their academic success. Such is typically the case for humanities journals, which are difficult to transform into author-pay Open Access and cost more than average due to illustrations and linguistic diversity (at least in quotations and references). Nevertheless, it came as a surprise to the ESHS and myself that Wiley informed us in January 2021 of its decision to stop publishing *Centaurus* by the end of that year. Luckily, we had actively been pursuing other options and could quickly speed up negotiations with a specialized publisher in the humanities, Brepols, to publish a new journal. Although it was not possible to buy *Centaurus*, as Wiley cited complex legal obstacles that

⁶ See, for instance, DEFER, 2022.

prevented them from selling the journal, we were able to negotiate that we could use the name ‘Centaurus’ for a successor journal (albeit with a new subtitle, for which we choose ‘Journal of the European Society for the History of Science’). By the summer of 2021, everything was ready to continue with *Centaurus* as a diamond Open Access journal in 2022, without a hiatus in publishing. The editorial board, the scope, the journal’s vision and mission, its governing principles and practices, would all remain the same, assuring continuity with the previous 70 years of *Centaurus*.⁷

The political push for Open Access had gained momentum especially in 2018 with the launch of Plan S, a bold initiative of funding agencies that requires their researchers to publish in Open Access (some eligibility conditions apply: e.g. publishing in hybrid journals is not supported).⁸ From the start, Plan S set the context for our preparations to make *Centaurus* Open Access, as many Europe-based historians of science would be subject to Plan S rules. As I was implicated from the start in the development of Plan S as an advisor (and later as a member of a cOAlition S team), I had a good idea of the challenges that Plan S would pose to the history of science community and to *Centaurus* in particular. It was especially worrying that initial outlines of the plan seemed to focus on a (‘gold’) author-pay model, which works for well-funded disciplines but could be disastrous for small fields like the history of science.⁹ Luckily, cOAlition S was receptive to such concerns and increasingly adopted measures to support ‘green’ and ‘diamond’ Open Access models. The ‘green’ route is not without its problems, however, as publishers are reluctant to allow preprints to be disseminated without an embargo period and researchers are wary that multiple versions of their text are being circulated. Indeed,

⁷ VERMEIR, 2021.

⁸ <https://www.coalition-s.org/>

⁹ For an initial response laying out potential utopian and dystopian effects of Plan S, see VERMEIR, RIEDE, LEONELLI, 2018. From my meetings with cOAlition S members it became clear that some were sensitive to the plight of small disciplines and scholars from the Global South while others focused on the big benefits Plan S would deliver (especially, to lower publication costs in socially important fields with high publication fees, such as the bio-medicine disciplines, and to ascertain quick free availability of results to spur innovation) and cared less about the potential collateral damage.

for a journal like *Centaurus*, which offers a lot of editorial support and a copy-editing service, there are often major differences between the initial submitted version, the accepted version and the final copy-edited version of the text. The ‘diamond’ route is even more challenging as, without subscriptions or author fees, it is unclear who will cover the cost of publishing. As such, Plan S puts serious pressure on the subscription model that is still the norm in the history of science without providing a clear alternative. Given these developments, the history of science community will need to develop new structures to support its high quality journals.

The ESHS and Brepols are committed to ‘diamond’ Open Access as the best solution to fulfill *Centaurus*’ mission. Furthermore, they are committed to provide both digital and print editions of the journal. Although an online-only journal would clearly be less expensive to produce, we feel that a print edition offers an indispensable added value at a time when online-only journals are disappearing from the internet at alarming rates, without leaving a trace.¹⁰ Even if some online-only journals have the plans, funding and technical means to preserve their articles ‘perennially,’ as historians, we are very aware of the transience of media in general and of ephemeral, digital media in particular. Taking into account these considerations, Brepols and the ESHS intend to fund the journal via an innovative Open Access model called “Subscribe to Open” (S2O).

The S2O model somewhat paradoxically combines the traditional infrastructure of library subscriptions with diamond Open Access principles.¹¹ The initial question is simple: “what if libraries agreed to continue paying the subscription fees to journals that they were already subscribing to, only the journals flipped to open access.”¹² The libraries would be “subscribing

¹⁰ BRAINARD, 2020.

¹¹ Subscribe to Open is an innovative model that uses the classical subscription model to convert gated journals to Open Access. Details about how this model works for *Centaurus* can be found at <https://spark.adobe.com/page/acIUDiX1DBs17/#subscribe-to-open>. For a general discussion of this model, see CROW, GALLAGHER, NAIM, 2020. For a project to use S2O to flip to open access publishing at a disciplinary scale, see <https://news.mit.edu/2019/mit-heather-paxson-open-access-model-workshop-0510>.

¹² WILLINSKY, 2020.

to open access”. This idea is elegant because it uses existing library networks and subscription infrastructures, making it possible for smaller publishers to flip journals to Open Access without developing new systems. It also takes into account that academic libraries increasingly have funding earmarked for supporting Open Access initiatives. As the ESHS and Brepols do not intend to make large profits from publishing the journal, subscription prices are very low and may become even lower if there is enough support from libraries and the history of science community in general. Furthermore, Brepols and ESHS have a stringent financial transparency framework that avoids the excess profits seen with other publishers. Of course, libraries could cancel their subscription thinking they can also get access for free, but over time, this would be a losing strategy. Indeed, if the transition to S2O is not successful, “the journal would have to revert to its traditional subscriptions and the libraries would be no further ahead and a little behind in their support for open access.”¹³ The long-term viability of *Centaurus* as an Open Access journal will thus depend on the willingness of its authors and readers to reach out to their libraries and institutions, explain the S2O model and convince them to support it.¹⁴ National Open Access plans in Europe are increasingly allocating support for S2O and the history of science community can request libraries to tap into this or equivalent funding sources to support *Centaurus*.

December 2021 brought a new surprise: Tech Science Press, a publisher operating from China and the USA, contacted me and the ESHS president that it was acquiring *Centaurus* from Wiley and intended to publish the journal in gold Open Access. Curiously, not only did Wiley not inform us of these negotiations, it had refused to sell the journal to the society a few months earlier (as I mentioned above) and now refused to entertain a new counter-offer from either the ESHS or Brepols. We have no idea of Wiley’s intentions and no further explanations

¹³ *Ibid.*

¹⁴ Colleagues can forward the information provided here to their libraries:

<https://spark.adobe.com/page/acIUDiX1DBs17/#subscribe-to-open>.

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were forthcoming so that we remain to this day into the dark about what was happening. In any case, a few weeks before launching the new journal we were suddenly in the uncomfortable situation that there would be two Open Access journals called ‘Centaurus’ with exactly the same aims and scope. Indeed, Tech Science Press had copied all the information from the Wiley webpages including the full editorial board (they forgot to ask our permission but kindly removed our names from their website after our request to do so). Furthermore, they launched an e-mail campaign to the history of science community to attract authors and find a new editorial board, which led many colleagues to write to me, annoyed about the unsolicited emails and confused about this situation. I also received many heart-warming messages from the academic community expressing their support to the ESHS and the new *Centaurus* we were launching.

Fortunately, our *Centaurus* team was well prepared, with several journal issues in the pipeline, some of them building on previous work published in *Centaurus*. Due to continuity in editorial policy, in the editorial team and in prospective contents we had such a strong claim to be the real ‘successor’ of *Centaurus* that we received assurances that we could be assigned the same ISSN number, virtually ascertaining the identity of the two journals. We are grateful that Tech Science Press realized that publishing a humanities journal like *Centaurus* is not viable without the full support of the community and they initiated contact to resolve the situation of the two *Centauri*. These and other factors contributed to successful negotiations with Tech Science Press, concluded in April 2022, which led them to cease their *Centaurus* operations and to transfer all the rights to the journal to the ESHS and Brepols. In this way, Tech Science Press provided an important service to *Centaurus* and academia because, in the way the events played out, they made it possible for the journal to become truly part of, owned by and published for the history of science community. This means that, despite the stormy

waters of the last year, *Centaurus* will continue as one and the same journal, building on a 70-year long tradition of publishing in the history of science.

Maybe the history of science community can glean some insights from *Centaurus*' experience when preparing itself to respond to the changing social, economic and political circumstances that influence its journals and publishing practices. One clear lesson is that placing a journal in the hands of a big publisher is no guarantee for its future, and the Open Access movement may be a good opportunity for the community to take back control over the journals that it outsourced or 'gave away' to commercial publishers in the last decades. Given that there are few departments in the history of science which can finance, host and organize a journal, academic societies or similar community networks seem to have a privileged role in supporting our journals. For the major journals, close collaboration with a publisher or publishing platform will still be important, however, as we cannot expect academics to take on and master all aspects of publishing.

Within the Open Access community, it is now a commonplace to state that publishers should only be "service providers": they should neither exert control over journals, nor should they make enormous profits of them. This is not enough, however, as Elsevier has recently presented itself in just these terms, arguing that as long as scientists want to publish without cost and libraries want to pay subscriptions, they would provide this service and resist policies that advocate a large-scale shift to Open Access.¹⁵ Instead of only providing a service, academic societies or communities need to discuss shared values with publishers and publishing platforms beyond issues of publication ethics.¹⁶ The ESHS and the Editorial Board of

¹⁵ In a panel discussion – somewhat resembling a cross-interrogation – participants of the 14th Berlin Open Access Conference asked the CEO's of the three big publisher how they planned to respond to new Open Access policies such as Plan S. Ron Mobed, CEO of Elsevier, responded that Elsevier's hybrid and subscription journals only provided a service to the academic community and would continue to do so as long as there was demand. He did not mention that the big publishers' control of the scientific publishing market and of how scientific credit is distributed (though impact factors, citation counts, etc.) creates and controls the scientists' and librarians' needs.

¹⁶ COPE is the standard-setting organization on publication ethics: <https://publicationethics.org/>

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Centaurus are delighted to have found in Brepols a reliable partner who shares our values related to the publication of scholarship.¹⁷ Such partnerships, based on a shared set of values, could be an interesting way forward for the history of science.

OPEN PEER-REVIEW

Transitioning to Open Access is a big challenge and a big change for a journal, but it is only the start of a more thorough transition to Open Science practices. How can the history of science create more opportunities for Open Collaboration? How can authors publish their data sets? Should we put these data sets in the hands of private companies like Elsevier or Google, or should we use other platforms? How is citizen science contributing to the history of science? And how should journal editors evaluate manuscripts by citizen scientists? These are questions that need to be discussed (and experimented with) by the history of science community. I cannot touch upon all these subjects in this short article, so I will focus on one particular form of Open Science that is especially relevant for an academic journal: Open Peer-Review.

As historians, we know that double-blind peer review is not a natural property of scientific practice.¹⁸ This is nicely exemplified in one of the ‘origin stories’ of peer review: when in 1831 the Royal Society started subjecting submissions to the *Philosophical Transactions* to expert examination, the process did not go smoothly. The reviewers fought about the purpose of reader’s reports, they disagreed on the merit of the paper, the author was shocked and refused to make any changes, and in the end, the negative report was suppressed, the article was

¹⁷ In this case, these values relate to putting the interests of scholarship above making profit, the importance of Open Access (and seeing science as a global public good), transparency of processes and finances, the role of editorial support, the continued importance of print etc. Shared values can be discussed for instance along the lines of the report INTERNATIONAL SCIENCE COUNCIL, 2021.

¹⁸ This section is in part based on my presentations for the ALLEA – GYA – STM Workshops on “The future of peer review in scholarly communications” held in November 2020 and on my contribution to the article GOWNARIS, VERMEIR, BITTNER et.al., 2022.

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accepted and the positive report published with it. As quality control, this process clearly had its shortcomings, but as Alex Csiszar has argued, from the start, peer-review was not so much about quality control as about the visibility and public appreciation of science.¹⁹ When one complains that peer-review is not ‘fit for purpose,’ one should be clear about what purpose it is expected to serve. When peer-review became more generally accepted in the 1960s and ‘70s, for instance, its main purpose still was not quality control but to show the relevance and accountability of science.²⁰ It is only later that peer-review becomes the ultimate stamp of approval for an article and a measure to assess the researcher too. This repurposing of peer-review fundamentally changed the way scientists publish (creating all kinds of well-known problems, such as the least publishable unit, over-production, fraud, etc.) and that, in turn, reinforced the importance of peer-review.

By now, double-blind peer-review is seen as the gold standard for scientific quality. Nevertheless, it is widely acknowledged in the scientific community that blinded peer-review faces problems: it delays publication of new results and has been accused to hide the inconsistency between reports as well as the low level of agreement between reviewers; furthermore, the insights formulated in the reports are lost to the scientific community, reviewers are not publicly accountable for their reports but also don’t get appropriate credit for their reviews, and there are little or no incentives to act as a peer reviewer. Furthermore, the increase of scientific publishing makes the amount of work involved in peer-review more and more unsustainable. This has led to the statement that peer review is “the worst way to judge research, except for all the others.”²¹ Nevertheless, there is in the researcher community still a high satisfaction rate about peer review and no alternative to peer review has received general acceptance.²² Instead, there have been numerous calls to reform traditional blinded peer review,

¹⁹ CSISZAR, 2016.

²⁰ See recent work by Alex Csiszar, Martha Baldwin, Aileen Fyfe and others.

²¹ CARROLL, 2018.

²² <https://senseaboutscience.org/wp-content/uploads/2019/09/Quality-trust-peer-review.pdf>

and forms of Open Peer-Review have the potential to remedy some of the problems that were mentioned above.²³

Currently, the meaning of Open Peer-Review is somewhat unstable and can refer to many different practices of openness in research evaluation (especially, but not exclusively, referring to the evaluation of manuscripts). The traditional meaning of Open Peer-Review is non-blinded review or ‘open identities,’ i.e. the identity of the reviewers is made public.²⁴ Innovations in the last two decades have given rise to other meanings, most importantly ‘open reports’ (making the peer review reports publicly available) and, to a lesser extent, ‘open participation’ or crowdsourced peer review, in which the wider community is invited to contribute to the review process.²⁵ It is clear how Open Peer-Review may remedy some of the problems with double-blind review. Open identities is the easiest way to give at least some credit to reviewers and increase their accountability. Open identities combined with open reports makes it possible to show what exactly reviewers have contributed, making more accurate recognition possible based on qualitative information, also giving the public access to the additional insights formulated by the reviewers. This openness makes reviewers accountable for their position and may incentivize them to write stronger, non-abusive and constructive reviews (although current data has not yet borne this out). It also gives access to any inconsistencies between reports that allows for discussion between reviewers and authors to resolve differences in opinion.

Despite its promise, Open Peer-Review itself faces challenges such as difficulties finding reviewers and concern about re-introducing bias in favor of the most established researchers,

²³ TENNANT, DUGAN, GRAZIOTIN, 2017.

²⁴ See FORD, 2013. Note that the review process can have several levels of “blinding,” usually invoked to avoid or reduce bias. Common versions of blind review are single-blind (the identity of the reviewer is hidden to the author) and double-blind (additionally the identity of the author is hidden to the reviewer) but all identities can be hidden also to the deciding editor (fully blind).

²⁵ Tony ROSS-HELLAUER, 2017, has also identified other meanings, including “Open pre-review manuscripts,” “open interaction,” “open final version commenting,” and “open platforms,” which are, however, much less prevalent.

or about creating ‘cartels’ of colleagues willing to positively review each other.²⁶ There may also be obstacles for specific groups of scholars to adopt it. A typical concern is that Open Peer-Review would expose early career researchers too much – as an author and a reviewer – and may be detrimental to their career. While negative peer review reports are always hard to digest, young scholars especially are reluctant to see harsh critique in print as it would expose them unnecessarily. They may also be unwilling to sign critical reports as reviewers and they may evaluate manuscripts more positively than they would otherwise. Some of these concerns may be overblown, however, as the requests for Open Peer-Review that I received as Editor of *Centaurus* have come from young researchers, while senior scholars have been more reserved when I raised the subject.

As I pointed out above, the challenges and opportunities of different forms of peer-review can only be assessed if we are clear about its purpose. If the point of peer-review is to *select* the best quality work and to give it a ‘stamp of approval,’ both blinded and open peer-review have advantages and disadvantages and may introduce their own kinds of bias. In any case, ongoing discussions show that one is not necessarily better than the other. If the purpose of peer-review is to *improve* the quality of published work in the history of science, Open Peer-Review may be an interesting route. Having access to peer-review reports of other manuscripts, seeing how manuscripts are gradually improved until they are accepted, and understanding that now-classic papers have also gone through sometimes major revisions have clear educational benefits. Not only does it make the peer-review process less arcane and intimidating, it may also improve equity in the field with respect to age, gender, social background and geography. Indeed, it has been remarked that scholars’ responses to an editor’s ‘revise and resubmit’ decision are gendered: while women were more likely to treat a ‘revise and resubmit’ as a

²⁶ On the difficulty finding reviewers, see VAN ROOYEN, GODLEE, EVANS et al., 1999. This is the author accepted manuscript, 2022 © Koen Vermeir, to be published in the journal *PHYSIS: International Journal for the History of Science*, LVII, 1, 2022. ISSN 2038-6265.

rejection, men often interpreted a rejection as a ‘revise and resubmit.’²⁷ There are similar dynamics that may disadvantage e.g. young scholars as well as researchers based in the thematic or geographical peripheries of the discipline. These can in part be remedied by constructive comments and follow-up emails by the Editor, and *Centaurus* has also a mentoring program in place to help young scholars improve their submissions and navigate the peer-review system, but Open Peer-Review could be an additional step.²⁸ Furthermore, if Open Peer-Review is combined with making available all versions of the submitted manuscript, one would expect the quality of first submissions to improve, which could unburden peer reviewers and improve the overall quality of publications in the history of science.

Finally, if the purpose of peer-review is the evaluation of researchers, Open Peer-Review would offer a much more fine-grained perspective than the binary yes/no of blind peer review. The top journals in any field assess articles based on a range of considerations, not only quality, and they often reject excellent manuscripts. With Open Peer-Review, even a ‘reject’ decision can contribute positively to a researcher’s evaluation, however, if the peer-review reports are supportive. Furthermore, there are high level discussions underway to fundamentally rethink research assessment as it has been too much based on output quantity and inappropriate metrics (impact factor, h-index, SJR, etc.). There is a strong interest to focus evaluation more on the research process and less on the output. Open Science is being considered as central to good research practice, in part because it will increase transparency of processes. If this vision on research assessment, which has been developed and is actively promoted by the European Commission, gains ground, Open Peer-Review looks set to become an important aspect of the ‘good research practice’ that will be at the core of research assessment.

²⁷ This gender differential may be widespread but most relevantly for the history of science, it has been noted by previous editors of *Isis* and commented on during HSS meetings.

²⁸ *Centaurus* traditionally offered the possibility to submit articles suited to open peer commentary but this is not well known and the option has rarely been used.

This section should not be read as advocating Open Peer-Review. I do believe, however, that the purpose of peer-review, and how this purpose can best be achieved, are important and urgent topics that should be discussed by the history of science community. How should journals organize peer-review to best serve the needs of the field? And should parts of this process be opened up? Open Peer-Review, itself diverse, is only part of a large spectrum of possibilities for the future of academic publishing. What is the role of a journal in a digital world, for instance? Do we still need journals? These are more radical questions that can also be entertained. Of course, some of these questions have been posed before, and so far existing structures have been quite resilient making academic practice rather conservative in its institutional innovations. Nevertheless, alternative models are actively being explored and in March 2021, the European Commission's launched its new Open Access publishing platform *Open Research Europe* (ORE) to serve the Open Access publishing needs of its Horizon 2020 and Horizon Europe funded researchers. It does not only follow an Open Peer-Review model, it also abolishes the academic journal, providing a platform that publishes articles across various disciplines.²⁹ This platform model had been tested out earlier for biomedical and natural sciences, and it was a big bet to expand the model to all disciplines. Because this publication model was totally alien to the humanities, the ORE team nervously awaited the first humanities submissions, and although early numbers showed that there was much more interest than anticipated, subsequent submissions seem to be lagging natural and applied sciences somewhat.³⁰ It will be interesting to see how the ORE platform evolves over time and whether it can be an interesting publication model also for the history of science. As this platform

²⁹ Open Research Europe uses "Gateways" to structure the contents of the platform according to source organization or theme.

³⁰ I was involved in the development and launch of ORE and this account is based on the interactions in internal team meetings.

functions without editorial oversight, it will also put the role of editors and the services they provide to the community in sharper relief.³¹

CONCLUSION

I have chosen to focus this contribution on important recent developments in Open Science that are impacting *Centaurus* and the history of science community more broadly. There are other topics that could have been addressed, such as the latest historiographical trends or the disciplinary identity of the history of science. As a generalist international journal, *Centaurus*' perspective on such questions is rather straightforward. *Centaurus* publishes the best work in the field, irrespective of methodology or historiographical school. As *Centaurus* is the official journal of the ESHS, we publish the rich variety of work that is done by the community of scholars, which is a pragmatic way to circumscribe 'the field.' If the interest of the community changes or broadens, this will be reflected in what is published. In any case, *Centaurus* stands behind the ESHS' approach to understand 'history of science' in the broadest sense possible, including e.g. the history of medicine and the history of technology as well as newer approaches such as the history of the humanities and the history of knowledge. (Although the focus on 19th-century definitions of 'science' has brought historiographical sophistication to the field, using this as a narrow demarcation criterion for a discipline seems rather provincial and Anglo centric). Furthermore, *Centaurus* is keen to open up the field to outside influences and actively encourages interdisciplinary submissions aiming to create new connections between the history of science and other disciplines.

I see our initiatives in Open Access and our attitude of openness towards a variety of themes, methodologies and interdisciplinary approaches as complementary ways to 'open up' the

³¹ VERMEIR, 2020b.

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history of science and become more inclusive as a discipline. Inclusivity and equity are essential parts of *Centaurus*' mission to nurture collaboration in the history of science in Europe and beyond. We are especially concerned with the challenges faced by many of our colleagues: by decreases in funding, the scaling down of institutions that host historians of science, the attacks on academic freedom and the destructive forces of war.³² These social, economic and political developments have a detrimental impact on the field, its diversity and vibrancy. We are convinced that *Centaurus*' transition to diamond Open Access is a way to support these colleagues, foster more collaboration as well as increase equity. Opening up the journal to more colleagues in this way will also increase inclusivity, giving the opportunity to hear an even larger diversity of voices that will enrich the discipline with new historiographies.

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