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OPEN SCIENCE: HUMAN EMANCIPATION OR BUREAUCRATIC SERFDOM?

*Maria Chiara Pievatolo**

*Dipartimento di Scienze politiche, Università di Pisa – Pisa, Italy.

Abstract

Since the Italian research evaluation system is based on an administrative agency that is in control of all the facets of academic life, it would be easy to add an OS mandate to the researchers' duties. But, if we conceive OS as a philosophical ideal of human emancipation through the opening of scholarly conversation rather than a management model, we have to ask: why does open science, today, *need* to be *mandated*? But, above all, *can* it be mandated? A Kantian thought experiment will help us to show that: (1) OS needs to be mandated because, against the spirit of the modern science revolution, it is not open any longer; (2) the very submission of research to blueprints dictated by an administrative authority reduces it to a bureaucratic, commodified enterprise whose horizon is not the advancement of learning - or discoveries and revolutions yet to do - but the production of information and data whose goal is determined by economic and political powers rather than by the will to knowledge

Keywords

Open science, Modern science, media, Plato, science publishing, bibliometric, research assessment, Galilei, ANVUR, Kant

1. *Open science: a modern revolution* [1]

However novel it may seem, Open Science is a revolution, whose practices are so extraordinary that they need to be *mandated* by funding and research organizations, only in an astronomical meaning. The idea that science, to be science instead of magic, should be made public is as old as Modern Science itself. Galileo Galilei did not need a mandate to have his *Sidereus Nuncius* put into print by a small publisher in Venice. And although one of Galilei's purposes was gaining the patronage of Cosimo de' Medici, he was eager to share his discoveries with the public as well, so that everyone might see and recognize their truth (Galilei, 1610):

"*Parmi necessario, per aumentare il grido di questi scoprimenti, il fare che con l'effetto stesso sia veduta et riconosciuta la verità da più persone che sia possibile*".

"It seems necessary to me, over and above other precautions, to maintain and increase the popularity of these discoveries, that as many people as possible see and recognize this truth." [2]

Publicity is one of the basic features of modern science: research cannot be secret any longer, because it needs the community of scientists to "provide for the social validation of scientific work" (Merton, 1968 in Merton, 1973b, p. 339). "Dissimulating, refraining from making one's opinions public, only means cheating and deceiving. […] Secrecy, according to science and within it, has become a *negative value*."(Rossi, 2015, II.5, transl. mine).

While depicting the similarities between printing and digital revolution, Clay Shirky remarked that the major difference between alchemists and the Early Modern chemists gathered in the Invisible College, precursor of the Royal Society,[3] was that the latter, unlike the former, shared their experiments and results,[4] by

[1] This article is an updated version of the work presented at the Workshop "Open Science: new models of scientific communication and research evaluation", organized by Virginia Valzano at the CEIT-University of Salento, on January 30, 2019. See: http://www.ceit-otranto.it/index.php/workshop/375-scienza-aperta.

[2] Transl. by Giuliana Giobbi in Pietro Greco, *Galileo Galilei: The Tuscan Artis*t, Springer, 2018, p.150.

[3] It is worth remembering that one of the earliest modern scientific academies was - although with some limitations - the Italian Accademia dei Lincei (Rossi, 2015, XVI.3).

[4] "To see this in fitting historical context, we must remember that the first scientific journals confronted not an excess but a deficiency of manuscripts meriting publication" (Merton, 1968, p. 216): since research used to be secret, publishing was hardly an ordinary choice.

"describing and disputing their methods and conclusions so that they all might benefit from both successes and failures, and build on each other's work" (Shirky, 2010). Within such a cultural revolution, the printing press was not the determining cause: it was just a means, which needed to be put under control and into use at the service of the new community of science.

Accordingly, the earliest scientific journal, the *Philosophical Transactions of the Royal Society,* was originally meant as a "social registry of scientific innovation"(Guédon, 2001, p. 5 ff), whose goal was not to deliver "research products", but to make theories and discoveries public in a socially controlled way, so that they could be properly attributed and civilly debated. It was, in other words, a way for coming to terms with the printing revolution and its new, enlarged publicity. Even the peer review process was not anonymous:[5] papers were formally presented, perused and reported by a couple of Royal Society fellows and publicly debated. Since the discoveries were noted in a confidential register, the printed journal was initially meant just as a way to present a selection of them to the public (Johns, 2009, p. 61).

"*The point of the Royal Society's reading regime was never to eliminate disputes like those through which Newton prospered. On the contrary, it was meant to generate them.* ***The intent was to produce fertile engagements between people who thought differently*** *and who might otherwise have had no common ground on which to meet. The Society's civility served first to bring this about, and then to limit and manage the resulting disagreements*" (Johns, 2009, p. 69, emphasis mine).

Was modern science open? According to the economist Paul A. David, it certainly was, but in the abridged version of a club good: since scientific research depended on patronage, opening it within academies, like the Royal Society, and their journals helped prospective patrons — aristocrats and kings — in selecting the best reputed scientists. Being accepted among the members of an academy and publishing in its journals were ways to enhance one's own status by means of a kind of "signaling value" and to gain the opportunity of participating in networks of expert "peers" (David, 2007, p. 57 ff). Such informational advantages, however, came at a price: journals and academies entailed a degree of closeness, or, otherwise stated, of conservatism (David, 2007, p. 68):

"*To be generous, one might conclude that what had been attained was a second-best (or maybe third-best) social outcome – gaining for "the insiders" the efficiencies of exchanging scientific information as a club good, but losing the possibilities of greater positive externalities from more closely approaching a scientifically meritocratic, universally open regime of cooperation in the pursuit of knowledge*".

2. *Allotrioi typoi*

At the end of the Enlightenment age, Immanuel Kant knew that scientific debate should be much more than seeking a status for the sake of its signaling value or of the opportunity to interact with a network of peers. Making a public use of reason - speaking "as scholars before the *entire* public of the world of readers"(Kant, 1784 Ak. VIII 37) - is not just about science, universities and academies, but about everyone's human emancipation. In fact, "when the public use of reason is free, a few of free thinkers can inspire everybody to rationally appraise their own value and to become aware of their call to think for themselves" (Kant, 1784 Ak. VIII 36). In Kant's opinion, scholars cannot conceive themselves as functionaries of particular collective organizations: they should consider themselves as member of the cosmopolitan society - the society of the citizens of the world. Against such a horizon, it becomes easier to grasp the narrowness and the unavoidable bias of any particular club, or, put in David's terms, why science as club good cannot be more than a second best.

The very printing press that made it possible to address a larger public shaped the way in which science was communicated and shared. Technological revolutions "enable the society to articulate entirely new forms of social action, but at the same time they irreversibly disable formerly available modes of social behavior" (Weizenbaum, 1976, p. 38). The purpose of the Royal Society reading regime was to generate open and public debates among scholars: yet, its goal was attained by paying an inevitable toll to

[5] "The first referee systems that we would recognize as such were set in place by English scientific societies in the early nineteenth century" (Csiszar, 2016).

printing, a media technology that intensified and gave industrial-scale power to a set of unbalances that Plato had already seen at work in the invention of writing (Plato, *Phaedrus*, 275a–b).

"For this invention will produce forgetfulness in the minds of those who learn to use it, because they will not practice their memory. Their trust in writing, produced by external characters (***allotrioi typoi***) wh*ich are no part of themselves, will discourage the use of their own memory within them. You have invented an elixir not of memory, but of reminding; and you offer your pupils the appearance of wisdom, not true wisdom, for they will read many things without instruction and will therefore seem to know many things, when they are for the most part ignorant and hard to get along with, since they are not wise, but only appear wise".*

Writing is a powerful tool, because it unlooses the transmission of information from word of mouth. Still, hearsay made possible a real-time "cognitive barter" and an interactive conversation that - as Plato knew - may create new knowledge as well. Writing, on the other hand, leaves a lasting record, but at a price: freezing the synchronous stream of oral conversations and slowing down the interactivity of our thought and learning processes (Harnad, 2003). Moreover, its physical durability - its potentiality to travel across time and space - may generate a kind of knowledge delusion: owning a lot of books and even having read a great deal of them may certainly convey us much information, but how can we be sure to know all that we believe to know if we do not check it by explaining, demonstrating, arguing and even being persuaded to change our minds by interacting with others?

How to take advantage of the power of writing without forgetting that knowledge is made of people and conversations? Plato's solution was based on two principles:[6]

- freedom of texts
- promotion of knowledge communities

Texts, it is true, provide reminders against forgetfulness (Plato, *Phaedrus*, 275d). They should, therefore, be used, but without taking them too seriously, because they are nothing without people. It is much more important "writing in the mind of the learner" (Plato, *Phaedrus*, 276a): after all, in a manuscript culture, documents cannot survive and last without people copying, reading, studying and commenting them. We have to embrace the "alien shapes" (*allotrioi typoi*) of writing to revive them as thoughts and ideas, because letters, without us, are dead.[7]

3. A question of trust: proxies - resistible and irresistible

According to Moses Finley (Finley, 1982, p. 46), we might say that all ancient writings were similar to *samizdat*, because they circulated as manuscripts, written and disseminated by hand. The very slowness of copying made the balance between persons and texts easier to attain: the craft of amanuensis could not overload the diverse scholarships, arts and crafts of knowledge communities with writings exceeding the amount of what the latter were interested in reading and, therefore, in preserving by having them copied. The printing revolution, however, gave writings the strength of an industrial production and, as we have seen, compelled scholars to build a new balance system, made of community-controlled scientific journals. In a long term perspective, even the current ICT revolution is simply a further step in such a growing unbalance between people and their knowledge communities, on the one hand, and media technology, on the other hand.[8] Today, when Jaron Lanier regrets that "communication is now often experienced as a superhuman phenomenon that towers above individuals. A new generation has come of age with a reduced expectation of what a person can be, and of who each person might become" (Lanier, 2010 ch. I), he is just dealing with the last chapter of an alienation process that started, some millennia ago, with the writing revolution: through the ages, more and more powerful media have being constantly increasing our potential dependence on the inherent knowledge illusion of their *allotrioi typoi*.

The printing process had its peculiar technological and economic bottleneck: since it was not possible to print everything, the

[6] A more detailed account on Plato's *Phaedrus* media theory can be seen in Pievatolo, 2006.

[7] In Plato's *Phaedrus* Socrates does not discuss with a communication expert, like Phaedrus, to establish whether or not the soul exists but to understand the relationship between communication technologies and the cultural environment they contribute to create (Pievatolo, 2012).

[8] Unsurprisingly, even the fear of information overload is as ancient as book writing (Weinberger, 2011, p. I.2).

manuscripts had be selected for publishing, through the expertise of commercial and scientific gatekeepers working as peer reviewers (Guédon 2001). For this reason, being published by a peer-reviewed scientific journal could be treated as a kind of scientific branding (Guédon, 2001, p. 16 ff), and receiving many citations within a selected set of scientific journals could be sold as a way to measure quality through impact. In other words, this very bottleneck made it possible, as of the second half of the previous century, to use journals and citations as proxies for scientific value. Mario Biagioli (Biagioli, 2018, p. 252) describes the outsourcing of research evaluation to bibliometric proxies as a double alienation.

"*Unlike traditional practices of evaluation that, like peer review, are not just qualitative but craft-based, metrics cannot be produced by a single scholar but are instead obtained, typically for a fee, from large data analytics corporations - yet another example of today's monetization of data. The introduction of quantitative and automated methodologies has thus introduced a new separation between the producer and the user of the evidence on which the evaluation rests - two roles that were traditionally folded into the same person: the scholar who read and judged. Metrics are therefore a "doubly alien" form of knowledge: both produced and used by people who are not practitioners of the field to which the publications belong*".

Against a long term historical horizon, such an alienation is just the last chapter of a long process of technological emancipation of the means - the media - from the knowledge contents and the debates they convey and on which they are based. Its steps can be summarized as follows:

- writing, with its *allotrioi typoi*, makes it possible to separate documents from people;
- printing, while industrializing the production of documents, adopts a selection method based on the choices of small groups of people that can be used as an evaluation proxy:
- ICT adds the power to transform those choices into data and to compute them.

The outcome of such a growing unbalance between knowledge communities and media is already entailed in Plato's ancient comment: it is the systemic delusion of "knowing many things, while being for the most part ignorant". And yet, this sequence is not enough to prove a doom of technological determinism: indeed, for many centuries after the printing revolution, scientific communities succeeded in keeping media under their control. For instance, during the 19th century great Devonian controversy, "the role of formal published papers in relation to informal argument during the controversy could aptly be compared with the role of occasional - and generally unrevealing - press releases during the real hard work of diplomatic negotiations behind closed doors" (Rudwick, 1985, p. 448). And when Charles Darwin's fellow scientists had to prevent a potential controversy with Alfred Russel Wallace on the priority of the former's or the latter's evolutionary theory it did not occur to them to invoke the authority of a journal. They just arranged a public reading of extracts from Darwin's manuscripts between 1844 and 1857 and of Wallace's draft essay before the Linnean Society of London.[9]

For journals, citations and metrics to become irresistible as research evaluation proxies, a further condition is required: a weakened and politically disqualified community of knowledge - whose inner"philosophical transactions" are not considered trustworthy, or are not considered trustworthy any longer.

"*The appeal of numbers is especially compelling to bureaucratic officials who lack the mandate of a popular election, or divine right. Arbitrariness and bias are the most usual grounds upon which such officials are criticized. A decision made by the numbers (or by explicit rules of some other sort) has at least the appearance of being fair and impersonal. Scientific objectivity thus provides an answer to a moral demand for impartiality and fairness.* ***Quantification is a way of making decisions without seeming to decide. Objectivity lends authority to officials who have very little of their own"*** (Porter, 1995, p. 8, emphasis added).

Even when the current, bureaucratic university managements governing alienated researchers call on the principles of academic freedom of the 19th century higher education model as defined by Wilhelm von Humboldt, they cannot actually follow them any longer. Humboldt was aware that research skills and crafts cannot be represented by proxies, but had to be assessed - or peer-reviewed - by knowledge communities.

[9] Reporting this event R.K Merton commented that "personal honesty is supported by the public and testable character of science" (Merton, 1957, p. 651). And it is remarkable that, in 1858, the publicity of science still took on the appearance of a public conference.

Hence, he tried to institutionalize and protect scholarly autonomy for reasons rather similar to those justifying judicial independence (Prodi, 2013, sec. IV).

"*It is a peculiarity of the higher scientific institutions that they always treat science as a problem that has still not been fully resolved and therefore remain constantly engaged in research, whereas the school deals with and teaches only finished and agreed-upon bits of knowledge*" (Humboldt, 2010, p. 230).

In Humboldt's perspective, science, in the widest meaning of the word, was not about information - or discoveries done: it was about advancement of learning - or discoveries yet to do. It is - as Richard Feynman would have said later - "the belief in the ignorance of experts" (Feynman, 1966): hence, it cannot be submitted to unbending accountability rules and quantitative evaluation criteria without sacrificing the knowledge yet to come on the altar of the established one. Accordingly, his public higher learning model - only a part of a comprehensive reform that was never fulfilled - was inspired by three principles (Humboldt, 2010, pp. 229–230):

1. solitariness (independence from corporate and political powers)
2. freedom (self-determination of research interests and topics)
3. cooperation (commitment to a common goal, within a common space of experience and debate)

Although it was carried out in a partial and classist way only (Ringer, 1969), the Humboldtian model was based on a project of human emancipation.[10] And it is noteworthy that the "Humboldt myth" arose at the beginning of the 20th century, when the government self-restraint was coming to an end and universities were beginning to metamorphose in state-owned capitalistic enterprises, as Max Weber had precociously understood (Weber 1919, emphasis added):

"*Of late we can observe distinctly that the German universities in the broad fields of science develop in the direction of the American system. The large institutes of medicine or natural science are 'state capitalist' enterprises, which cannot be managed without very considerable funds. Here we encounter the same condition that is found wherever capitalist enterprise comes into operation:* ***the 'separation of the worker from his means of production****.' The worker, that is, the assistant, is dependent upon the implements that the state puts at his disposal; hence he is just as dependent upon the head of the institute as is the employee in a factory upon the management. For, subjectively and in good faith, the director believes that this institute is 'his,' and he manages its affairs. Thus the assistant's position is often as precarious as is that of any 'quasi-proletarian' existence and just as precarious as the position of the assistant in the American university*".

"The exercise of free mind space requires trust" (Neeson, 2019) : but how is it possible to achieve it in a competitive, corporate-like research system populated with quasi-proletarian researchers the meaning of whose work does not depend on them, not even collectively? That is the reason why open science, today, needs to be *mandated*: because *any* evaluation standard, within such a system, is basically mandated.

The earliest scientific journal was founded to build a system of trust *among* scientists and scholars as "peers", not *upon* them. However, the current "big science" or "industrialized science' can no longer rely on small communities whose main strength was the trust flowing from personal acquaintances and common practices of debate (Ravetz, 2016). Therefore, its corporate-like management resorts to proxies - core journals and bibliometric indices - to rule over a growing mass of proletarianized researchers they can neither trust nor understand.[11]

[10] R.D. Anderson (Anderson, 2010) wittily remarks that "the Prussian aristocrat also became an unlikely hero of the German Democratic Republic. […] Humboldt was given a positive place in official Marxist historiography, as the East German regime sought to present itself as the heir of the nationalist and progressive forces of the reform era. The bourgeoisie had then been the carrier of those forces, and Humboldt's concept of humanism had been a universal value with the potential to emancipate the whole people. Necessarily limited in its application in absolutist and bourgeois conditions, the ideal was fulfilled under socialism."

[11] The very quest of an "objectivity" disconnected from any disciplinary knowledge claim is facilitating the gaming of the system: see for instance Biagioli, 2016, Fire & Guestrin, 2019 and, as regards Italy, Baccini, De Nicolao & Petrovich, 2019. Another instance of R.K. Merton's essential paradox of the social action? (Merton, 1973a, pp. 245–246).

4. *Open science: philosophical ideal or research management model?*

In a research system ruled by academic capitalism, why *mandating* Open Science? The concerns of Open Access early advocates were not mainly economical, but cultural, political, philosophical, as witnessed by the first paragraph of the original BOAI Declaration (*Budapest open access initiative*, 2002, emphasis added):

"A*n old tradition and a new technology have converged to make possible an unprecedented public good.* ***The old tradition is the willingness of scientists and scholars to publish the fruits of their research in scholarly journals without payment****, for the sake of inquiry and knowledge. The new technology is the internet. The public good they make possible is the world-wide electronic distribution of the peer-reviewed journal literature and completely free and unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds. Removing access barriers to this literature will* ***accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge***".

According to them, Open Access was meant as a way to transform science - a club good - in a wider public good, through open electronic archives and new scholarly-driven open access journals. In their program, economics was a means and not an end, because they believed that an open Internet, properly used, had the potential of doing away with the technical and economical bottlenecks of printing by lowering the dissemination costs and by emancipating authors from the practice of transferring their copyright to publishers.[12]

In a world populated with Humboldtian universities, autonomous knowledge communities and unalienated scholars, the ICT revolution would have provided the tools[13] to enhance the implementation of an ideal - the freedom of reason in its public use - already practiced and shared. On the other hand, in a corporate university (Holmwood, 2013), whose managers need to use proxies to assess researchers whom they cannot understand and do not trust, open science as a means of human emancipation is doomed to remain a rhetorically lofty but factually marginalized ideal. Unsurprisingly, the Open Access movement did not even succeed in solving the so-called serials crisis: if the metrics and journals that analytic services providers and commercial publishers are selling[14] maintain their proxy function, oligopolies will hold and even strengthen their dominant positions as well (Larivière, Haustein, & Mongeon, 2015).

That is why, again, Open Science, in Europe, needs to be mandated: because neither researchers nor administrators are able to grasp and to apply its principles any longer, since they have built or have accepted to yield to a system of irresistible proxies based on a technologically old-fashioned association of science communication and research evaluation (Guédon, 2017, p. 36). And that is also why also a mandated open access might not be enough to solve the serial crisis (Pinfield & Rob, 2018): if proxies' authority remains unscathed, the journals overpricing might just shift from subscription prices to publication fees (Velterop, 2016).

However, the current condition of scientific publishing seems to offer a glimmer of hope. On the readers' side, bypassing publishers' paywalls has become easier, because of the blossoming of gray and black market servers (MacKie-Mason, 2018) like preprint repositories (Markin, 2018) and Sci-Hub. They gave universities and library consortia a stronger negotiating position[15] and the opportunity to launch collective initiatives like Plan S, pushing towards a full and immediate Open Access to scientific publications. At the same time, on the publishers' side, a very recent SPARC landscape analysis has captured a worrying collateral effect of the ongoing transition of academic publishing "from a

[12] "Open Science critiques the *status quo* of knowledge production by asserting the importance of democratizing knowledge, by reassessing the power relations in our knowledge infrastructure, and by arguing that scientific knowledge needs to be managed in collaboration with those who help generate it and will benefit from it" (Tony Horava, Preface to Chan, Okune, Hill, Albornoz, & Posada, 2019).

13 See, again, Harnad, 2003 but also Lévy, 1997.

[14] See for instance, in addition to Guédon, 2001, also Buranyi, 2017.

[15] Italy, however, did not seize such a favorable opportunity and signed a questionable agreement with Elsevier. See the AISA statement about it: *Hybrid Open Access: why paying twice?* (2018).

content-provision to a data analytic business" (SPARC, 2019, p. 5, emphasis mine):

"*This is evidenced by a change in the product mix that they are selling across higher education institutions, which is expanding beyond journals and textbooks to include research assessment systems, productivity tools, online learning management systems – complex infrastructure that is critical to conducting the end-to-end business of the university.*

"Through the seamless provision of these services, these companies can ***invisibly and strategically influence, and perhaps exert control****, over key university decisions – ranging from student assessment to research integrity to financial planning*".

If combined with strong Open Access mandates, such a trend might help us to attain an open publishing ecosystem, but within a landscape of data and platform capitalism. Although not necessarily less expensive (Tennant, 2019), openness would be compulsory for researchers, but its purpose would not be an human enlightenment with some market benefits, but the reduction of knowledge to commodity, "a gigantic open data reservoir which those who enjoy access to the appropriate technologies can draw from at will in pursuit of their own material interest" (Hagner, 2018). Open science may certainly yield some profitable discoveries and inventions as well: but interpreting and justifying it as a commodity for the sake of private entrepreneurial profit and state bureaucracy efficiency would sacrifice the many to the few in at least two senses:

1. Public funds would be devolved to private profits: under a commodified[16] open science system papers and data, however open, are meant just as raw matter or, at most, semi-finished products for the production of proprietary, for-profit, goods and services, within a legal horizon made of pervasive copyright and patent rules.
2. Research would not regain its autonomy and responsibility,[17] because its final meaning would remain post-academic: proprietary, local, authoritarian - even its openness is mandated -, commissioned, expert (Ziman, 2000, p. 78).

According to the Humboldtian model, science had to be open because it was defined by its inclination to go beyond the established. Its openness mirrored the openness of the Humboldtian purpose of education, *Bildung*, conceived as an "active process of appropriating the world" by developing the inner freedom of persons whose sense cannot be wholly determined by society and the market (Konrad, 2012, p. 123). In open science as research management model, on the contrary, "open" means just "open for business". Alienated researchers, already accustomed to "publish or perish" and bibliometric assessments, would bow also to an "open or perish" bureaucratic imperative, because they have already perished - or perhaps never lived - as autonomous, critical minds. Taking inspiration from Kathleen Fitzpatrick, we might represent them as undead (Fitzpatrick, 2011): their mandated behavior may imitate Humboldtian or Mertonian mores, but just as empty pretenses whose meaning lies elsewhere, in corporate "end users" whose concern in openness is, at most, instrumental and contingent, for the sake of *private* profit.[18]

5. *Two steps backwards: Italy and the research evaluation knot*

Whatever the meaning of open science might be, the Italian universities made a precocious verbal commitment to it. In 2004, a very large majority of Italian university rectors signed a Messina Declaration, supporting the Berlin Declaration on Open Access (2003) (JLIS.it, 2012). However, between 2008 and 2010 Berlusconi's government severely cut the higher education budget (European Universities Association, 2009) and promoted a centralizing university reform (Adendorff, 2010) that made administratively difficult any distributed transition to open science. But the project to submit the Italian research to a centralized administrative control

[16] "Commodification" of science is "any process in which scientific activities and their results are predominantly interpreted and assessed on the basis of economic criteria" (Radder, Nordmann, & Schiemann, 2011, p. 86 and (Radder, 2010).

[17] It is not just about principles: conflicts of interest in privately influenced research have consequences. See for instance (Leslie, 2016).

[18] On the other hand, "publicly funded scientists, regardless of whether they pursue research on the scale of nanometres or light years, have a moral obligation to address public needs, provide *public goods*, and to disseminate, not protect, knowledge stemming from their work"(Moriarty, 2008, emphasis added).

was hardly a figment of Berlusconi's mind: already in 2006, under Romano Prodi's second term as Prime Minister, a decree with the force of law had established the National Agency for the Evaluation of the University and Research Systems (ANVUR). Later, in 2013, a law including a regulation for Open Access imposed some obligations on research institutions and universities about articles based on publicly funded research. Although its mandate allowed an unjustifiably long embargo period (18 and 24 months from the publication date), it remained - unsurprisingly - largely theoretical because it did not provide sanctions for non-compliance and did not cope with the management of intellectual property rights (Moscon, 2013).

On the other hand, the ANVUR, whose board members are appointed by the Minister of Education[19] and whose criteria are directly defined and enforced by ministerial decrees, is currently in control of all the facets of Italian academic life. It imposes automatic bibliometric criteria as "objective measure" for research evaluation, professorship qualification and even individual micro-grants to researchers or pay raises. Bibliometric metadata used in the assessment exercise depends either on proprietary, closed databases (Scopus, Clarivate Analytics) or on lists of journals compiled by the ANVUR according to questionable criteria (Mazzotti, 2012). Moreover, the raw bibliometric data on which ANVUR evaluations and rankings are based are neither open nor accessible (Baccini & De Nicolao, 2018).

Thus, while the urge to reconsider the use of journal-based metrics to assess research is gaining somehow momentum,[20] assessment in Italy has taken the shape of a centralized administrative evaluation dependent on closed bibliometric data and ministerial decrees. In Italy, bibliometric evaluation,[21] is not a decentralized choice made by some university administrators and somehow shared by researchers: it is an obligation enforced by a government agency that can only be challenged by costly and time-consuming appeals to the administrative courts. Hence, it is easy to understand why moving from words to deeds is so difficult in Italy, whatever meaning we may attribute to "open science". A non-negotiable bibliometric research evaluation needs bibliometric data, and the easiest - even if not the smartest and the cheapest - way to find them is relying on proprietary databases like Scopus and Clarivate Analytics and on the journals indexed in them. Such a choice, obviously, does not help to solve the serial crisis.[22]

The backwardness of research assessment in Italy - centralized, controlled by the government, enchained to rigid quantitative parameters - is an extreme instance of the administrative authoritarianism (Srigley, 2018) that is stiffening, globally, an activity for whose freedom the natural philosophers of the early modern age had to fight. Its bureaucratic over-organization under the twin powers of Big Business and Big Government (Huxley, 1958 III) can help us to understand that asking why open science needs to be mandated is not enough: we should ask, more radically, if open science can really be mandated.

A critical appraisal of A. Bonaccorsi's attempt to justify the State assessment of research in Italy might help us to answer such a question. Bonaccorsi is, as it were, a Zimanian more than a Mertonian scholar:[23] while his research field is

[19] The ANVUR board candidates are selected by a committee whose members are appointed by the OECD secretary general, by the president of the Accademia dei Lincei, by the Consiglio Nazionale degli Studenti Universitari, by the Minister of Education and by the president of the European Research Council (https://anvur.miur.it/): the final choice about the appointments to the board is up to the Minister of Education. Among the listed institutions, only the Consiglio Nazionale degli Studenti is based on a selection by vote, since it is elected by the Italian students. Comparatively, even the current semi-representative government of Hong Kong is more democratic than the Anvur.

[20] See for example the *San Francisco Declaration on Research Assessment* among whose signers are currently included, for instance, the universities of Oxford and Cambridge.

[21] In the fields of human and social sciences, the Anvur claims not to use bibliometric, but a home-made list of administratively approved journals (Mazzotti, 2012) whose ranking is rather similar to the system that Australia adopted - and dropped - some years ago (Creagh, 2011). However, calling such a system "not bibliometric" is hardly accurate, as the academic career of Italian SSH scholars depends on the amount of articles published in journals included in the Anvur lists.

[22] In 2012 the Harvard University total operating expenses amounted to about three billions of euros, while, in the same years, the funding of the whole Italian university system was only 6,83 billions. In the same year, however, Harvard was able to warn that its library could not afford journal publishers' price and to encourage its faculty members to prefer open access journals (Sample, 2012).

[23] As Roberto Caso remarked, writing papers to vindicate the activity of the agency we serve can hardly be seen as an

business economics, he served and is serving as an official in a few governmental and inter-governmental organizations. As a former board member of the ANVUR, he wrote a book, *La valutazione possibile*,[24] whose major goal was showing that the Italian State research assessment was not only scientific, but scientifically sound as well. An abridged English version of his argument can be read in the preface of a collection of essays edited by him and published by a powerful commercial publisher, mostly under a paywall, in spite of being funded by public money.[25] It is not just about Italy: if even the Italian State research evaluation - centralized, bureaucratic, authoritarian - were convincingly conceivable as scientific, open science could be mandated and, yet, remain science.

5.1 The scale and the sword: peer evaluation and State assessment of research

"*At the end of the day, the legitimation of research evaluation will be achieved when people will recognize it is an integral part of the academic profession. We evaluate and we are evaluated. We see and we are seen, all the time. And since working in the academy is perhaps the most rewarding profession in the world, one might also expect that evaluating oneself and the others is a source of professional satisfaction, while being evaluated (yes, sometimes negatively) is part of life*" (Bonaccorsi, 2018a XVI).

Italian professors, apparently, have still to learn to be evaluated. How is it possible, after millennia of academic controversies, that, in the motherland of Galilei and Fermi, of Giordano Bruno, Aquinas and Benedetto Croce, scholars need to be taught such a basic fact of academic life by a board of functionaries appointed by the government? If evaluation meant the "peer evaluation" wonderfully painted in Raffaello's *Scuola d'Atene*, Bonaccorsi's remark would sound like a platitude. It would not sound so, however, if evaluation were intended as an assessment exercise established and directed by the government. The difference between these two meanings can be illustrated by considering a well-known passage of Kant's *Perpetual Peace*:

"*The jurist, who has taken as his symbol the scales of right and the sword of justice, usually uses the latter, not merely to keep any extraneous influence away from the former, but will throw the sword into one of the scales if it refuses to sink (vae victis!). Unless the jurist is at the same time a philosopher, at any rate in moral matters, he is under the greatest temptation to do it, for his business is merely to apply existing laws, and not to enquire whether they are in need of improvement. He acts as this truly low rank of his faculty were in fact one of the higher ones, for the simple reason that it is accompanied by power (as is also the case with two of the other faculties)*".[26]

Kant advocated freedom and free speech for philosophers, i.e. for pure or fundamental research,[27] because of their ability to offer society independent, truth-oriented point of views. The independence of philosophy, however, is not due to some special feature of philosophers and their scholarship, but to their disconnection from the government and its power. Jurists seem to be powerful, but are just functionaries at the service of the government: the very ministerial power conferred to them makes them scholars of a lower rank, because they are always exposed to the temptation of using their position to win any argument, throwing, metaphorically, their sword on the scale like the Gaulish chieftain Brennus (Livy, *Ab urbe condita*, V.48.9). Philosophers, on the other hand, cannot end controversies in such a way because they have no swords, but only questionable and questioned scales. Whereas jurists can hardly be more than Zimanian scholars, philosophers have the opportunity to be Mertonian scientists: the power of the former depends on their political appointment to a ministerial function, while the authority of the latter is based only on their ability to persuade their peers with their argumentation. Bonaccorsi, on the contrary, tries to trivialize the difference between assessing research by the sword, as a functionary appointed by the government, and

example of Mertonian disinterestedness (Caso, 2017b, sec. 6).

[24] Bonaccorsi, 2015. I wrote a detailed critical review about it in Pievatolo, 2017.

[25] Bonaccorsi, 2018a xvii. Some of the trickiest arguments of the Italian version are absent from the English one: for instance, a misquotation of Cole, 1992, p. 175 has been luckily removed (Pievatolo, 2017, § 8.2).

[26] I. Kant, *Zum ewigen Frieden*, Ak VIII,369, transl. in Kant, 1991.

[27] The faculty of philosophy, in Kant's *Der Streit der Facultäten* (Ak VII, 28), included history, geography, philology and the humanities, natural sciences, mathematics and philosophy proper.

evaluating it by the scale, as a scientist among scientists (Bonaccorsi, 2018a V, emphasis added).

"*Research evaluation is an activity that has two, not just one, sources of legitimation. On the one hand, the parliament and the government in many countries have created dedicated structures to carry out research evaluation and actively make use of their results. This is a legal and institutional form of legitimation. It* ***comes from the legitimate democratic authority of modern states.*** *On the other hand, however, scientific and academic communities create and manage a different source of legitimation, based on* ***scientific recognition and expertise****"*.

According to him, these "two sources of legitimation" are not in opposition to each other, but concur in justifying his assessment activity at the service of the Italian government. After all, who would dare to put into question the "legitimate democratic authority of modern states"?[28] The point, however, is not whether the hand wielding the sword of political power is legal, but whether such a sword may interfere with the measurement given by the scale without adulterating it. Even if we discovered that Brennus was a democratically elected leader of the Senones, the difference between weighing gold by the sword and weighing it by the scale would remain unchanged. Reaching an agreement on the proper way of weighing gold through experimentation and conversation is not the same as unsheathing the sword to get the last word. Hence, stating that "it is mandatory for those involved in research evaluation to open a never-ending dialogue with the scientific communities, in order to gain legitimation from a bottom-up and trust-based process, not only from the (inevitably top down) institutional procedures" (Bonaccorsi, 2018a V-VI) is not enough: if State assessment of research requires "inevitably top down institutional procedures", the last say is left to the sword, however long the alleged "dialogue" may be. In Italy, *Caesar est supra grammaticos*.

5.2 A sociological theory of science

Bonaccorsi's planned "never-ending dialogue with the scientific communities" is mainly addressed to human and social scientists, with the purpose of "building up an argument about the scientific nature of SSH, based on a thorough recognition of the way in which they build up valid knowledge" (Bonaccorsi, 2018a V). Social and human scientists, in other words, need to be persuaded that the Italian State assessment of research can portray their work as it would be evaluated by themselves, or, metaphorically, that the ministerial sword thrown on the scale exerts no influence on the result of the weighing. However, if Bonaccorsi argumentative endeavor were successful, it would make the whole State assessment of research useless: why bothering to drop an expensive administrative sword on the scholarly scale if the result remains the same? Perhaps, his very attempt to minimize the weight of the sword betrays that Italy's heavy political interference in activities that should be constitutionally free both in their practice and in their teaching is indeed a rather worrying question.

As regards science, technology, engineering and mathematics (STEM), Bonaccorsi seems to believe that journals and citations are more than proxies whose function depends on the legacy of printing technological and economical bottlenecks: core journals and citations build a qualitative yet measurable hierarchy that mirrors the "hierarchical system" of science, "based on a cumulative process of reputation building" (Bonaccorsi, 2018a, pp. 3–4). As regards social sciences and the humanities (SSH), an "epistemic approach" can yield a "thorough recognition of the way in which they build up valid knowledge" (Bonaccorsi, 2018a VIII, 7). Robert K. Merton would have treated such an approach as a "sociological theory of knowledge", aimed at identifying the social foundations of valid knowledge (Merton, 1941, pp. 41–42) and would have refrained from such an "adventure in polymathy"[29]

[28] Indeed, some democratic states, including Italy, give scientific research a constitutional protection. About the article 33 ("The arts and sciences as well as their teaching are free") of the Italian Constitution, inspired by the experience of fascist cultural subjection, see for example Santosuosso, Sellaroli, & Fabio, 2007.

[29] "Science is a deceptively inclusive word which refers to a variety of distinct though interrelated items. It is commonly used to denote (1) a set of characteristic methods by means of which knowledge is certified; (2) a stock of accumulated knowledge stemming from the application of these methods; (3) *a set of cultural values and mores governing the activities termed scientific*; or (4) any combination of the foregoing. We

In fact, a sociological theory of knowledge is prone to the danger of being just a more sophisticated and convoluted way to state "ipse dixit". For either the ministerial evaluator is able to recognize, internally, each of the scientific ways in which every single discipline builds up valid knowledge, or he can just take, externally, a picture of the social mores through which scientific communities establish the validity of a claim. If the former were true, the appointment by the government would magically transform the ministerial evaluator in a polymath, who could assess research without bibliometric proxies because he would be familiar with every disciplinary method. But if the latter is more plausible, the evaluation of research is led to depend on a huge, fallacious *argumentum ab auctoritate*, stemming from a confusion between good science and socially successful research, or between the validity of a theory and its impact.[30]

In STEM, according to Bonaccorsi, valid science is the highly cited science published in a list of top-journals; in SSH the situation is more complicated and requires more studies to get the longed-for rankings, with the help of expert reviewers. appointed by a hierarchy of nominated officials whose top is, as usual, the Anvur board.

ANVUR's assessment system has raised many criticisms: for instance, its very dependence on stiff, centralized administrative rules and parameters exposes it to the effects of the Goodhart's law, a kind of uncertainty principle applied to social sciences. Italian researchers seem to have learned to game the system.[31] Here, however, the alleged "never-ending dialogue with the scientific communities" comes to a dead end. When asked about the failures[32] of their centralized and enforced quantitative performance rating of research, their answer is always the same: even if they were true, they would be irrelevant, because it are based just on anecdotal evidences.[33] Providing more and more evidences and citing more and more literature[34] to show that the failures of quantitative assessment systems are not irrelevant would trap us in the sorites paradox.[35] How many instances of failure would State evaluators require to admit that the quantitative system they are enforcing corrupts research instead of improving it? Always one more. And, since they can and do end the conversation by throwing their ministerial sword on the scale, keeping on discussing about it would be just a Sysiphean endeavor. Hence, to avoid the paradox and reach a conclusion, we have to try another way, which does not rely on a data analysis always exposed to the danger of being supplemented by more or less comfortable *ad hoc* hypothesis.

5.3 State evaluation of research: the - administrative - pool of Narcissus

For the sake of argument, let us assume the Italian State assessment of research could mirror it in a perfectly faithful way: that, in other words,

are here concerned in a preliminary fashion with the cultural structure of science, that is, with one limited aspect of science as an institution. Thus, we shall consider, not the methods of science, but *the mores with which they are hedged about*. To be sure, methodological canons are often both technical expedients and moral compulsives, but it is solely the latter which is our concern here. *This is an essay in the sociology of science, not an excursion in methodology*. Similarly, we shall not deal with the substantive findings of sciences (hypotheses, uniformities, laws), except as these are pertinent to standardized social sentiments toward science. *This is not an adventure in polymathy*." (Merton, 1942, p. 268), emphasis mine.

[30] On that subject, Figà-Talamanca, 2002 is still worth reading.

[31] Baccini et al., 2019 documented the effects of Goodhart's law in Italy: but they are hardly an Italian peculiarity (Fire & Guestrin, 2019).

[32] The system can fail both "upwards", when it is not able to recognize the merit of very brilliant and innovative researchers (Flaherty, 2015), and "downwards", when it provides perverse incentives, encouraging manipulation and fraud (Smaldino & McElreath, 2012; (Edwards & Roy, 2016).

[33] See Bonaccorsi, 2018b, p. 5: "I find most arguments about the possibility of manipulation of bibliometric information, such as the Impact factor, rather pointless. Science itself is manipulable. There are many examples of fake discoveries or misbehaviour of scientists. The truly interesting question is not why these things happen, but why they happen so infrequently and how it happens that they are almost invariably discovered and punished') and (Redazione Roars, 2019)

[34] See, just for instance, the extemporaneous list offered by Giuseppe De Nicolao here.

[35] Briggs, 2011: the poison of the paradox is the confusion between quality and quantity. From a qualitative point of view, scientific theories are not fungible objects, but mutually irreplaceable unique pieces: hence, the Wakefield affair and its consequences cannot be dismissed as "anecdotal" even if his article about an alleged link between MMR vaccine and autism were the only accident of the high Impact Factor journal that published it (Belluz, 2018). On the other hand, from the quantitative point of view of an auditing system, the target is not the unfathomable quality of every single paper, but its conformity to a prescribed, computable standard, regardless of its contents (Biagioli, 2018, p. 266 ff.).

the Italian State assessment of research really portrayed the work of Italian scholars as it would be evaluated by themselves if they were still free to do it. In such a counterfactual condition, Caesar would be still "supra grammaticos", but his evaluations would magically be identical to the judgments made by the Italian scientific community. Let us assume, moreover, that gaming and fraud were not just, as alleged, anecdotal, but nonexistent, and that the evaluators appointed by government were perfectly fair and, therefore, they were able to depict a faithful portrait of science done right. All these theoretical points are conceded to make clear that the question is not whether the Italian State assessment research is accurate, or useful, but whether is *right* - whether, in other words, a fanciful perfect Caesar would be entitled to be *supra grammaticos*.

In his essay on the Enlightenment (Ak VIII 39-40, transl. in Kant, 1991, p. 57), Kant takes into consideration the case of a society of clergymen, democratically or aristocratically ruled, which, after a long discussion, commits itself freely to a certain unalterable doctrine of faith. Is it entitled to do so? According to Kant, a perpetual commitment would be "a crime against human nature" and would "prevent all further enlightenment of mankind forever". If a church assembly took - even democratically - such a decision, it would contradictorily deprive the next generations of that same right to deliberate and to apply their own understanding of which it had made use in defining the dogma. A system of beliefs - or even an ethos - whose justification depends on its partakers' free choice cannot be codified in a coercive norm without cutting the root of its very legitimacy. If its established doctrine deserves to be accepted *because* it has been freely discussed and chosen by a community, it should be possible to keep on debating and choosing it not only yesterday or the day before yesterday, but also today and tomorrow.

Kant, who lived under an absolute monarchy, remarked that in general, "to test whether any particular measure can be agreed upon as a law for a people, we need only ask whether a people could well impose such a law upon itself" (AK VIII 39).

"*Something which a people may not even impose upon itself can still less be imposed on it by a monarch; for his legislative authority depends precisely up his uniting the collective will of the people in own*" (AK VIII 39-40).

Such an argument can easily be extended from politics to science. Since science - or, at least, modern science - does not rely on the authority principle but on the freedom of an unended quest, no collective choice, however democratic, may stop its discussion: the next generation of researchers may continue the quest only if they retain the same liberty that was bestowed to their predecessors. Something which a scientific community cannot impose upon itself can still less be imposed on it by an administrative authority. Even if the State research assessment issued a perfectly faithful picture of the collective self-evaluation of scientists, its mirror would have the paralyzing effect of the pool of Narcissus: Ptolemy would consistently suppress Copernicus - science past would systematically suffocate science future. In more prosaic words, when the sword of a political evaluation, however democratic, steps in the processes of research, science cannot be compared to an open, competitive market[36] any longer.

The criticism of Kant against political interference in all the intellectual endeavors requiring an autonomous reason and a sincere faith is normative, not empirical. Kant does not look - *à la* Foucault - for some soft power hidden in the fabric of society. Even if the administrative sword were as light as a feather, its power - the power to suppress the future and possible for the sake of the past and the established - would be hard, and in plain sight:[37] research cannot be constrained by some irrevocable past decision, without ceasing to be science, just like faith cannot be constrained according some

[36] "The kind of competition experienced in science is similar to the situation of competitive markets, in which entry is open, incumbents never get a monopoly position, and it is not possible for an incumbent to manipulate strategic variables to its own advantage" (Bonaccorsi, 2018b, p. 5).

[37] Unsurprisingly, the State assessment of research in Italy has been criticized by legal scholars, accustomed to cope with the unconstitutional face of power which a Foucauldian approach may leave hidden in plain sight: see Caso, 2017b, § 6 and Caso, 2017a. Perhaps the reason of such a neglect is already concealed in a 1971 conversation, openly accessible in Chomsky-Foucault, 2007, between Foucault and Noam Chomsky: if every struggle is about power and none about justice, there is no way to distinguish the scale from the sword, or soft power from hard power, even when the latter is violating constitutional rights. Interestingly, Bonaccorsi loves to cope with criticisms derived from the current Foucauldian scholasticism (Bonaccorsi, 2018b, p. 20 ff.).

irrevocable dogma without ceasing to be faith and becoming bureaucratic despotism.

6. Conclusion: open access and open mind

Whatever the meaning of open science might be, the Italian universities Open Access advocates have to deal with a plenty of administrative and legal questions, because the very open access movements have had to work in an environment stiffened by a pervasive copyright law and a bureaucratic research assessment. Being overwhelmed by the challenge of the day and saluting the administrative open access and FAIR data mandates enforced by governments and research funders as the final goal of their endeavors is understandable, yet dangerous. For a mandated but enclosed openness of text and data, within an authoritarian research system stifling open science and open minds exposes us to a risk of which a computer scientist and philosopher like Joseph Weizenbaum, whose Jew family had left Nazi Germany in 1936, was already aware more than forty years ago (Weizenbaum, 1976, p. 1, emphasis mine):

"*In 1935, Michael Polanyi, then holder of the Chair of Physical Chemistry at the Victoria University of Manchester, England, was suddenly shocked into a confrontation with philosophical questions that have ever since dominated his life. The shock was administered by Nicolai Bukharin, one of the leading theoreticians of the Russian Communist party, who told Polanyi that "under socialism the conception of science pursued for its own sake would disappear, for the interests of scientists would spontaneously turn to the problems of the current Five Year Plan." Polanyi sensed then that "the scientific outlook appeared to have produced a* ***mechanical conception of man and history in which there was no place for science itself****." And further that "this conception denied altogether any intrinsic power to thought and thus denied any grounds for claiming freedom of thought.*"

Meanwhile, the former Soviet Union, with its ambition to deal with the future by planning it, has come to an end.[38] Yet, whoever does not let himself be overwhelmed by the demands of the day can - and should - ask whether the openness worth pursuing is just about texts and data, and not also, and above all, about minds.

[38] According to Porter, 1995, p. 43, its mechanism, however, is still thriving in the West: "Zinoviev's remark about Soviet economic plans applies with few changes to bureaucratic business corporations in the West: quantification is simultaneously a means of planning and of prediction."

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