

Libre opinion – Opinion

How has neoliberalism weakened science?

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Abstract – The current Covid-19 pandemic, and before that, the environmental crisis due to climate change, raise major questions about the relationship between science and society. More than ever, public opinions in OCDE countries question the legitimacy of scientists and scientific knowledge. The reasons for this fracture are obviously multiple and complex, but we believe that applying neoliberalism principles to research has contributed to it. In this article, we show how the funding of research by private institutions, staff precariousness, the ‘publish or perish’ policy have changed the way in which scientific knowledge is produced and decreased the confidence of citizens regarding scientific output. We believe it is high time to launch a wide debate on these issues within the scientific community. We should take advantage of both the climate and the health crises to put fundamental scientific issues and the role of scientists in society back on the table, so that science as a social activity (production and diffusion) is taken back into the hands of scientists in public institutions where conflicts with private interests are limited.

Keywords: science policy / neoliberalism / publications

Résumé – Comment le néolibéralisme a-t-il affaibli la science ? La pandémie actuelle de Covid-19, et avant elle, la crise environnementale due au changement climatique, soulèvent d'importantes questions sur les relations entre la science et la société. Plus que jamais, les opinions publiques des pays de l'OCDE remettent en cause la légitimité des chercheurs et de leurs connaissances. Les raisons de ce décalage sont évidemment multiples et complexes, mais nous pensons que le cours néolibéral appliqué à la recherche y a contribué. Dans cet article, nous expliquons pourquoi le conditionnement des financements de la recherche à la participation d'institutions privées aux projets, la précarisation du personnel, le mode « *publish or perish* » ont changé la manière de produire des connaissances et diminué la confiance que les citoyens ont en la production scientifique. Il nous semble important aujourd'hui d'ouvrir un large débat sur ces sujets au sein de la communauté scientifique. Nous devons profiter de la crise climatique et de la crise sanitaire pour remettre sur la table les questions scientifiques fondamentales et le rôle des chercheurs dans la société, afin que la science en tant qu'activité sociale (production et diffusion) soit reprise en main par les chercheurs au sein d'institutions publiques où les conflits avec les intérêts privés sont limités.

Mots-clés : politique scientifique / néolibéralisme / publications

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The current Covid-19 pandemic, and before that, the environmental crisis due to climate change, raise major questions about the relationship between science and society. More than ever, public opinions in OCDE countries question the legitimacy of scientists and scientific knowledge. To understand this phenomenon, we need to analyze the recent changes that have occurred over the past 40 years in our societies in the way we produce knowledge and in university teaching.

The new public management

Neoliberalism is an economic and social transformation project set under the sign of the free market, including the institutional arrangements to implement it (Chiapello, 2017). A crucial feature of this project is the 'New Public Management', i.e. a set of organizational schemes imported from corporate business into public institutions, which serve to promote the self-inflicted control of science (Connell *et al.*, 2009). Since the late 1970s, OCDE States have promoted policies that have led to a transition from the model of perennial public endowments from the State budget to government-sponsored agencies, thus introducing a new kind of public policies based on short-term dotation, excellence policies and individual incentives along with the new modes of scientific knowledge production (Nowotny *et al.*, 2001). As a result of these changes, the organization of research has moved from research programs managed by permanent and independent research teams with statutory jobs, to research under a project system with non-permanent scientists and non-recurrent funding. The stated objective of all these projects is to serve the need for 'innovation', a notion often poorly defined in official policy guidelines which brings together scientists and downstream stakeholders in defining research questions and objectives. This transition has profoundly changed the ways scientific knowledge is produced (Nedeva and Boden, 2006). It has promoted a system of managerial evaluation of science based on bibliometrics and quantitative indicators in terms of publications and citations, rather than on the quality of scientific questions or on the coherence and continuity of scientific careers (de Gaulejac, 2012). This has been made possible by increased precariousness in higher education and research that makes people vulnerable to pressure to deliver short-term results and publish more. In 2015 the French association 'Sciences en Marche' carried out a survey of precariousness in higher education and research. In research institutes, non-permanent staff made up 26.6% of the 57,000 personnel (including 30% of the 24,000 researchers). The situation was even worse in higher education with 35.2% of the 179,000 contractual staff. In addition to these non-permanent staff, there are

130,000 temporary lecturers, 92% of whom teach less than a quarter of the time¹.

In the meantime, this new system of knowledge production proves inadequate to address the current challenges of both the climate and the health crises, as these require long term science to understand and analyze all their determinants, and not only specifically short-term dedicated programs. Some authors have promoted 'slow science', that is, resisting the fast, competitive, benchmarked research, which is becoming the norm (Stengers, 2016). We need long-term, sustained funding to monitor the impacts of climate change. We need cooperation to consolidate our theories and time to ensure that the research information and results disseminated to the general public are as robust as possible.

Our hypothesis is that this new course of capitalism has both endangered the original specific mode of scientific knowledge production described, for instance, by Bourdieu (2001) and complicated the relations between the scientific world, civil society, and politicians.

The new era of the publication market

To understand the mechanisms underlying this systemic change, considering the role of scientific publishers and the structure of the publication market itself (de Gaulejac, 2012) is crucial. Indeed, this commodification (i.e., the action of treating something as a mere commodity) of knowledge production has been achieved through the control of a small number of private groups over scientific publishing, that has monetized the rights of access to publications for states and universities. Thomson Reuters, the company which developed this citation system used to specialize in the listing of financial markets. Institutions and universities promoted this system by introducing individual and group evaluations based on citation indices. Consequently, Elsevier, Springer and Wiley, who acquired a number of their competitors, now publish 42% of journal articles (Monbiot, 2011), generating huge profits as a result. Reported net margin for RELX (Elsevier) was between 16.7% and 22.4%². Nature Publishing Group, which has merged with Springer Science + Business Media to form the Springer Nature Group, generates a revenue of 1.72 Billion € with a net margin of 22.4%. These groups have built up an alarming concentration of power. Springer Nature Group publishes more than 3,300 scientific journals and belongs to a holding company (Holtzbrinck Publishing Group) which also

¹ <https://precairesdelesr.files.wordpress.com/2020/01/20170601-bilan-enquete-precarite-sciences-en-marche.pdf>.

² <https://www.relx.com/investors/key-financial-data>.

controls numerous tools for editing (Overleaf) or bibliometric analyses (Dimension, Altmetric). RELX holds ScienceDirect (3,800 scientific journals), the world's largest platform dedicated to peer-reviewed scientific research, as well as Scopus, an abstract and citation database of research literature, and SciVal which gives insights into the research performance of over 16,000 research institutions. Researchers have a vital need to be informed of their colleagues' results, consequently their institutions subscribe to these journals regardless of their number and price. Thus, there is no supply-side regulation in this market. However, the volunteer habits of the previous era have been maintained: researchers are the ones who carry out the research, write the articles, review them, and for the major part edit them, all without charging anything. In parallel, a rating system for scientific publications based on citations quantification was set up. This system makes it possible to rate all scientists and institutions based on the number of citations of publications. Publishers can then index the price of papers to the number of citations; this is at present the way to evaluate researchers and tomorrow could be the way to estimate their salary, rather like for soccer players.

Why is this 'market-based system' threatening science?

Science is a very specific mode of social knowledge production (Merton and Shapere, 1974) where the relations between agents and institutions are subject to specific laws (dialogical and argumentative) resulting from the two fundamental, closely linked properties of closure (or peer competition) and the 'arbitration of reality' (Bourdieu, 2001). The recent developments described above threaten this specific mode of knowledge production.

First of all, the 'publish or perish' approach (Kiai, 2019) and the procedures for evaluating researchers and their projects has led to an explosion in the number of scientific publications. This makes it difficult to carry out quality peer review and contributes to a dilution of scientific information, lack of reproducibility of measurements, or even to an incitement to scientific fraud. The scientific community has warned about these abuses and tries to remedy them as in the San Francisco Declaration³. Many scientists have lost moderation in the summaries and discussion of their work, thus making the emergence of truly new results difficult (Kiai, 2019).

Secondly, competition for access to project funding has increased competition between research actors, and research in project mode can become an obstacle to

genuine scientific collaboration through a cooperative approach (Edwards and Roy, 2016).

Indeed, the injunctions of funders and scientific publishers and competition between scientists have favored a 'society of the spectacle' in the scientific field. Many articles or oral presentations have catchy titles, often out of step with their content. We have entered the era of science promises made to funders, promises that are often not kept, resulting in lay society disillusionment (Coutellec, 2015). In the medical field, the main funding of drugs research by the pharmaceutical industry orient research projects towards molecules that will be profitable. Consequently, studies on drugs efficiency are not solely based on public health or scientific issues, but also on economic considerations.

We believe that these dynamics have contributed to weakening the specificities of the scientific field in its ability to patiently produce facts of increasing verisimilitude, but also in the confidence of the broader public in the reliability of scientific results. Public opinions in OCDE countries are increasingly suspicious about scientific discourses on sensitive issues such as vaccines, the reliability of medical treatments or climate change. We also especially note the development of a science confidence gap: some people place great trust in scientific methods and principles, while simultaneously distrusting scientific institutions (Achterberg *et al.*, 2017). Some epistemologists have accurately described this new mode of scientific production (Nowotny *et al.*, 2001), but in our opinion, they have insufficiently criticized its consequences, especially regarding the dilution of the scientific method. This work has also had a prescriptive effect (Lamy, 2007) by promoting the dependence of science on the stakeholders, whoever they may be. In a political time that can be described as 'populist' (Galston, 2017), such dynamics weaken rational discourse and encourage conspiracy theories. At a time of environmental and health crises, such drifts in scientific communication are becoming critical. The discourses of a few media-prized scientists have replaced the patient summaries of experts duly mandated by state or inter-state institutions. During the Covid-19 crisis, preprints, sometimes of very poor quality, have been widely disseminated by the general press and considered as valid information. The multiplicity of comments made by individual scientists, sometimes contradicting each other publicly, convey the impression that scientific issues are just like personal opinions, that can be debated like others by anyone, even those in no way involved in the issue under discussion. This evolution does not strengthen public confidence in science. There is an urgent need to reorganize the plurality of scientific viewpoints based on strong collective expertise.

³ <https://sfdora.org>.

New avenues for science production

We must take advantage of the climate and the health crises to put fundamental scientific issues and the role of scientists in society back on the table, so that science as a social activity is taken back into the hands of scientists. If society needs science, this is because science produces knowledge of a specific value with a degree of verisimilitude superior to other forms of knowledge for expertise and decision-making. Paradoxically, it is in the name of its usefulness that science must be viewed and promoted as an ‘ivory tower’ protected from the influences of private interests and from the ‘society of the spectacle’. The autonomy of science has nothing to do with a blank check: it is the very condition for the democratic and environmental responsibility of scientists.

As a consequence, in a world where the scientific and technical stakes have never been so high, there is an urgent need to change the way we produce and disseminate scientific knowledge. Academic societies and scientists must regain control over scientific publishing. Scientists must regain autonomy over the choice of their research programs, which requires a permanently recruited staff and recurrent funding to universities and laboratories. Evaluation panels must stop their directives focused on quantitative scientific production to halt the exponential growth in publication numbers. We need to promote a decrease in the number of publications to allow for a new growth of real discoveries. We need a well-educated population which understands the course of science to address current societal issues and allow a wide transmission of the knowledge produced. Consequently, access to higher education must be facilitated with, if possible, free higher education, contrary to the current evolution where the commodification of knowledge transmission has also resulted in an unprecedented increase in fees.

References

Achterberg P., de Koster W., van der Waal J., 2017. A science confidence gap: education, trust in scientific methods, and trust in scientific institutions in the United States, 2014,

- Public Understanding of Science*, 26, 6, 704-720, <https://doi.org/10.1177/0963662515617367>.
- Bourdieu P., 2001. *Science de la science et réflexivité*, Paris, Raisons d’agir.
- Chiappello E., 2017. Critical accounting, research and neoliberalism, *Critical Perspectives on Accounting*, 43, 47-64, <https://doi.org/10.1016/j.cpa.2016.09.002>.
- Connell R., Fawcett B., Meagher G., 2009. Neoliberalism, new public management and the human service professions. Introduction to the special issue. *Journal of Sociology*, 45, 331-338, <https://doi.org/10.1177/1440783309346472>.
- Coutellec L., 2015. *La science au pluriel. Essai d'épistémologie pour des sciences impliquées*, Versailles, Quæ.
- Edwards M.A., Roy S., 2016. Academic research in the 21st century: maintaining scientific integrity in a climate of perverse incentives and hypercompetition, *Environmental Engineering Science*, 34, 1, 51-61, <https://doi.org/10.1089/ees.2016.0223>.
- Galston W.A., 2017. The 2016 U.S. election: the populist moment, *Journal of Democracy*, 28, 2, 21-33, <https://doi.org/10.1353/jod.2017.0021>.
- Gaulejac V. (de), 2012. *La recherche malade du management*, Versailles, Quæ.
- Kiai A., 2019. To protect credibility in science, banish ‘publish or perish’, *Nature Human Behaviour*, 3, 10, 1017-1018, <https://doi.org/10.1038/s41562-019-0741-0>.
- Lamy J., 2007. Penser les rapports entre sciences et politique : enjeux historiographiques récents, *Cahiers d'histoire*, 102, 9-32, <https://doi.org/10.4000/chrhc.242>.
- Merton R.K., Shapere D., 1974. The sociology of science: theoretical and empirical investigation, *Physics Today*, 27, 52, <https://doi.org/10.1063/1.3128814>.
- Monbiot G., 2011. Academic publishers make Murdoch look like a socialist, *The Guardian*, 29 August, <https://www.theguardian.com/commentisfree/2011/aug/29/academic-publishers-murdoch-socialist>.
- Nedeva M., Boden R., 2006. Changing science: the advent of neo-liberalism, *Prometheus*, 24, 3, 269-281, <https://doi.org/10.1080/08109020600877667>.
- Nowotny H., Scott P., Gibbons M., 2001. *Re-Thinking science. Knowledge and the public in an age of uncertainty*, Cambridge, Polity.
- Stengers I., 2016. “Another science is possible!” A plea for slow science, in Letiche H., Lightfoot G., Moriceau J.-L. (Eds), *Demo (s). Philosophy, pedagogy, politics*, Leiden, Brill, 53-70.

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