

## **National Open Science Days: speech by Frédérique Vidal**

Frédérique Vidal spoke at the first National Open Science Days on Thursday December 6<sup>th</sup> 2018.

*English translation by Richard Dickinson – Translation Unit, Inist-CNRS.*

### **ONLY THE ADDRESS AS MADE CAN BE CONSIDERED VALID**

Almost five months ago to this day, I announced the implementation of a plan that sets out France's commitment to open science.

Open science is neither a current of thought, nor a fashion, a posture or a technical or editorial preference. It is a force that challenges established practices and mentalities, a gesture that liberates the dynamics of progress through knowledge and it is a self-evident necessity for anyone who wants to give knowledge the power to transform the world and support rationality which is undermined too often.

To recognize this evident fact is one thing, to make it a reality is quite another. There are financial, technological and cultural obstacles to the decompartmentalization of science which cannot be overcome without the commitment of the entire scientific community.

This is why I am delighted to see so many of you both here in this room and online for these first National Open Science Days, the last day of which I am happy to open today.

I have confidence in our collective ability to win this cultural battle because this aspiration already exists in the scientific community. We are not starting to write on a blank page - far from it! And I also welcome the fact that many of our major organizations and research operators have signed up to the DORA declaration.

I know I do not need to remind you that the web was invented at the CERN then offered to the world as a common property and as a gesture towards founding open science. I know I do not need to remind you that open science existed before the invention of the web - researchers have always sent reprints to each other to share their work with their colleagues. And in 1991, even before the web appeared, physicists developed a service called ArXiv which was the practical solution to a practical problem. These physicists wanted to exchange their articles more easily, quickly and universally ahead of the slower publication process. Then, in 1995 researchers created Mathdoc in France, in 1998 Scielo in Brazil, in 1999 Erudit in Canada and OpenEdition in France, in 2001 HAL in France and Open Journal Systems in Canada, in 2003 Plos in the United States, etc. These were all the initiatives of researchers who aspired to more modern and democratic services.

Let us go back in time together - the first issue of the first scientific journal was published in Paris on January 5<sup>th</sup> 1665 in the form of a twelve-page bulletin with the clearly stated objective of making known "new events in the Republic of Letters" under the name of Journal des sçavans. Until then, scientists had exchanged letters with great intensity. The Journal des sçavans gathered these letters and gave them a wider, more universal distribution for access.

Open science is nothing more than the Journal des sçavans reinvented in the age of the Internet!

For it is not so much a question of creating new rules as of responding to an intrinsic need for science whose progress is cumulative and fuelled by the confrontation of knowledge from all horizons. We might say "Science wants to be free" in an adaptation of Stewart Brand's famous sentence.

I am not just confident because open science is clearly going in the same direction as history but also because it is essential for our future.

What does the contemporary world with its multiple, planetary, protean challenges expect from research? That research enhances international dialogue by fully including Southern hemisphere countries, that it should produce knowledge which fuels the innovations that respond to our societal requirements and that the knowledge produced should irrigate public debate and political decision-making.

Open science is the key to achieving these 3 ambitions. It enables equality of access to research results to be restored within the scientific community so that all laboratories and organizations can fully contribute to the production of new knowledge wherever they are in the world. In doing so, open science promotes and increases scientific excellence by making researchers' work available to a much wide audience. An article that is read, cited and commented upon more will have a greater chance of being criticized, improved and matched up with other results with the corresponding results then having more chance of being used.

Finally open science enlarges the readership for research far beyond the academic sphere. It enables knowledge to cross all frontiers and benefit SMEs, NGOs, the associative sphere and all citizens. In this way we will be able to build a society which is fully in charge of its own future because it will no longer accept the onslaught of fake news without discernment, because it will possess the reference framework to make choices and the necessary material to imagine, create and innovate. Open science is thus a magnificent opportunity to bring different knowledge together and stimulate serendipity which has given birth to numerous discoveries.

Causing such collisions of knowledge more and more gives a promise of fine scientific advances and numerous technological and societal innovations all over the world.

It is this scientific strategy, this innovative approach, this public policy that I want to support thanks to the national plan for open science. It has a highly ambitious objective – that 100% of articles and books but also - while fully respecting the relevant regulations - data from research financed by public investments following calls for projects should be disseminated in open access. The idea underpinning this policy is very clear namely that everything which has been funded by the public should be returned to the public. Science is public property and should be accessible for everyone. The National Research Agency will make this an obligation for all projects selected in 2019. I am also extremely pleased that the CURIF's<sup>1</sup> universities

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<sup>1</sup> Coordination of French Research-Intensive Universities

have implemented an open science plan which provides generalized open access to their academics' publications.

Of course the idea is not to comfort ourselves with fine principles and be content with this humanist dream while neglecting the very real constraints, particularly those of a material nature. Open science is not an ethereal idea or a utopia with no grounding and contingencies. It is often dependent on 21<sup>st</sup> century digital services and is therefore a matter of coordination and the right business model.

I have seen some posters during these open science days. They reflect the diversity and liveliness of the proposals, initiatives and solutions available to us. I take note that we are in an extremely intense phase of invention of the "rules of the game" for open science.

First among these rules is the construction of a new business model for scientific publishing. This brings me back to Stewart Brand's which I will now quote in its entirety: "On the one hand information wants to be expensive, because it's so valuable. The right information in the right place just changes your life. On the other hand, information wants to be free, because the cost of getting it out is getting lower and lower all the time. So you have these two fighting against each other". This tension needs to now be solved by open science.

Beforehand, we must clear up a misunderstanding because often stereotypes and preconceptions are responsible for holding up the spread of open science. Open science is not, and cannot be, free science. While it is essential that readers should not pay the costs and that usage should be open, clearly scientific publications still come at a cost which must be structurally covered.

Science cannot do without publishing which provides scientific added value through its critical view but science should not be suffocated by the weight of publishing or shut behind prohibitive paywalls. To escape this deadlock, we need to construct a new more balanced and diversified publishing landscape. The major publishers will still have their place as long as their prices are more representative of the real costs and innovative publishing solutions should be able to develop in parallel. This is why the plan for open science provides for the creation of a fund dedicated to open scientific publishing. Its funding will derive from the negotiations we are currently having with publishers whose prices are excessive. This fund will be managed by the Open Science Committee which the presidents of the major higher education and research establishments have accepted to take part in under the authority of the general director of research and innovation, Bernard Larroutourou. This committee will take decisions on how this funding is used in perfect transparency.

I believe it is essential that the fund should support sustainable and viable business models at the world scale.

As you know, in part of the open publishing world, authors themselves pay the publication costs. This funding mechanism is not in majority use today. If it were to become dominant, it could have significant consequences in terms of the geopolitics of science. I am not convinced that systematically moving the barrier from the reader to the author is a virtuous concept. The CEO of the French National Research Institute for Development (IRD) continually reminds me that this model is dangerous for our international cooperation with researchers in the

Southern hemisphere. Representatives of some disciplines also say that it is neither desirable nor possible in their community. Without excluding this mechanism in principle, this is why I hope that diverse economic models will develop to ensure the system is resilient and able to efficiently adapt to the plurality of situations.

In this respect, I am watching the development of SCOSS (Global Sustainability Coalition for Open Science Services) initiated by Sparc Europe in 2017 with great interest. The principle of this scheme is that non-commercial services considered as essential open science infrastructures throughout the world should bid for pooled funding each year. Applications are examined according to a series of criteria such as added value for the various research actors, governance, the cost and sustainability of funding and development projects. These are the operational proposals for sharing the costs of the services we need. I would like France to participate in this as actively as possible until it perhaps actually joins the organization. Indeed, it is my conviction that the answer is not a solely French solution to the issue of open science which is also one of the reasons why I have supported the "Plan S" from the beginning.

This is especially important because since the challenge of open science is not limited to publications, far from it. This would be tantamount to reducing science to its conclusions, when these derive their full value from the process that produced them. Sharing science therefore also means sharing all the steps of the scientific process, the data and the software processing which was applied during that process. Data and source code are a breeding ground for discovery and innovation which we cannot afford to ignore.

This is a key to the future competitiveness of our research which we are not focusing enough on yet despite some remarkable initiatives.

If we want to make full use of this scientific material, we need to preserve it better, structure it better and share it better while also respecting privacy and professional, industrial and commercial secrets. This is the thinking behind a flash call from the National Research Agency with a budget of 1.5 million euros which will be launched at the beginning of 2019 to disseminate practices well beyond the communities which are already involved and to speed up the structuring, citation and opening up of research data from French teams.

Make no mistake - all these issues have a major societal impact despite their inherently technical nature.

The discovery of the hole in the ozone layer is a prime example. From the 1970s onwards, Joseph Charles Farman used a Dobson spectrophotometer and weather balloons to record the ozone concentration in Antarctica. In 1980, he detected a significant decrease in this concentration. He compared this finding with NASA satellite data which showed no anomalies. At first he thought his equipment was defective but a new instrument gave similar measures in 1984. NASA later admitted that its satellites had correctly identified the hole but their data processing system had rejected these abnormal values... And this was confirmed by returning to the original data which had not been reprocessed using a cleansing algorithm which was subsequently found to be harmfully over-zealous... The open science paradigm could probably have saved these lost years. You all know what happened next, with the adoption in 1987 of the Montreal Protocol to reduce the use of chemicals which harm the ozone layer. This story

invites us to ask an "open" question namely how many holes in the ozone layer have we missed by not sharing our data?

Now is not the time to rewrite history but to invent a new world in which the free flow of knowledge becomes the norm. I would like to thank you all for contributing, through your commitment, your debates, your exchanges of good practices, to this scientific project, which is also and above all a social project.