

A more open science

The editor-in-chief of *Nature* and a director of the Royal Society meet at FAPESP to discuss the challenges and limitations of open access to scientific data

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Open access to data has no value in itself because open science is more than simply the availability of scientific data.” This assessment is that of British physicist Philip Campbell, editor-in-chief of one of the world’s most prestigious scientific journals. During a brief trip to São Paulo, Campbell participated in a conference entitled “Science as an Open Enterprise: Open Data for Open Science,” which took place on February 25th at FAPESP. Before a full auditorium, the participants discussed the challenges and changes to open access to scientific data. It was during the event that Foundation scientific director Carlos Henrique de Brito Cruz addressed the prospects of open access to scientific data in Brazil. José Arana Varela, chief executive officer of FAPESP’s Executive Board, and Martyn Poliakoff, foreign affairs secretary for the Royal Society, served as mediators.

The discussion concerned a Royal Society report published in June 2012 in which the world’s oldest scientific society highlighted the need to broach the issue of open access to scientific data, now accessible in ever greater quantities, albeit not always intelligible or of interest to researchers. “Rapid technological change has given rise to new forms of access, storage, handling and transmission of collections of data that stimulate new modes of communication and collaboration,” says Poliakoff. The study was prompted in 2009 by a debate in the United Kingdom involving

hacked emails from climatologists that were eventually published. In this case, the messages suggested that a scientist had sought to conceal data countering global warming claims. An investigation ruled out the notion of falsification, but the case gave rise to debates concerning the need for a more open atmosphere surrounding the scientific profession.

Campbell explained that scientific data should be not only merely accessible but also rendered comprehensible and useful. Noting one of the reasons for not delaying open access to data, the physicist emphasized his hope of encouraging the public’s trust in science through the replication and duplication of research findings. Open access, according to Campbell, can also help to counter academic dishonesty and to encourage public participation in the sciences.

The Royal Society report presents an example of such public collaboration. In 2011, an outbreak of intestinal *Escherichia coli* spread from Germany to the rest of Europe, infecting approximately 400,000 people. Doctors in Hamburg were unable to find a solution because, upon initial examination, the bacteria resembled those of other strains. The problem was resolved only when data on the genome of the *E. coli* strain were published on the Internet and made available to researchers everywhere. Soon afterwards, approximately 200 scientific reports were published presenting suggestions on how to curb the epidemic.



Technology provided new modes of scientific communication and collaboration, the report shows

Campbell, from *Nature* (at left) and Poliakoff from the Royal Society: open access can increase the public's participation in the sciences

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According to Martyn Poliakoff, the Royal Society representative, “the information we have today determines how scientists must adapt to technological, social and political changes in a manner that profoundly affects the way in which science is conducted and communicated.” The chemist also talked about his work with PeriodicVideos (www.periodicvideos.com), a program that distributes entertaining science-related videos. The program began in 2008, thanks to a partnership between the University of Nottingham and the BBC of London.

THREE MODES

In addition to the publication of research data, another topic of discussion during the meeting was the use and diffusion of tools for accessing papers published in scientific journals. Campbell noted the three modes of open publication of articles: one that allows free and open access to the paper within six to 12 months after its publication; a second, in which the paper can be accessed from the time it is published; and, finally, a hybrid model that allows open access to only a portion of the paper once the author has paid a fee for its immediate issue. When asked whether open access to data can affect

scientific communication, especially lay science journalism, Campbell responded that he did not believe the system would necessarily improve the process of communication. According to Campbell, it does not matter whether articles are freely accessible or available only to those who pay a fee because the best journals will always evaluate and publish the best data. What may happen, he went on to say, is that a journal that makes its content freely available will receive feedback on its content in the form of comments and corrections more promptly, thereby contributing to the quality of particular papers upon publication. “Freely accessed content might be a little better (as compared to content openly available only after payment of a fee),” says Campbell.

Carlos Henrique de Brito Cruz, FAPESP’s scientific director, reminded the audience that the debate surrounding open access to data is not an entirely new one, citing Brazilian data banks available through the Internet. He went on to mention the freely accessible information made available by the National Institute for Space Research (INPE), the Brazilian Institute of Geography and Statistics (IBGE) and the Lattes Platform of the National Council for Scientific and

Technological Development (CNPq), providing academic information from more than 174,000 researchers. Brito Cruz also pointed to FAPESP’s Scientific Electronic Library (SciELO), a virtual source that provides free and open access to 270 Brazilian journals and receives about one million hits a day. “It’s an important mechanism that contributes to increasing the visibility of Brazilian science throughout the world.” Another important development was the agreement signed two years ago to create a repository for all articles related to FAPESP-financed research. These articles would be made available in accordance with the norms of the journal in which a particular paper is published. The repository is scheduled to be operational by the second half of this year.

Philip Campbell noted that although he was not familiar with Brazil’s current science agenda, he nonetheless recognizes the county’s efforts to position itself internationally. By way of example, Campbell mentioned FAPESP’s backing of research projects linking scientists and businesses. “I believe that this sort of financing is valuable, besides encouraging a link between universities and industry,” he said. ■