

## Science Community Needs to Address Threats by Research Assessments

by Roger Pfister

**T**he International Union of Pure and Applied Chemistry (IUPAC) has a long-standing commitment to the International Council for Science (ICSU), a non-governmental organization with a global membership of national scientific bodies representing 141 countries and 31 International Scientific Unions, including IUPAC since 1922. Among its three strategic priorities, the Council works to promote the Principle of Universality of Science, enshrined in its Statute 5 and adherence to which is a condition of ICSU Membership.

### The Principle of Universality (freedom and responsibility) of Science

The free and responsible practice of science is fundamental to scientific advancement and human and environmental well-being. Such practice, in all its aspects, requires freedom of movement, association, expression and communication for scientists, as well as equitable access to data, information, and other resources for research. It requires responsibility at all levels to carry out and communicate scientific work with integrity, respect, fairness, trustworthiness, and transparency, recognising its benefits and possible harms.

In advocating the free and responsible practice of science, ICSU promotes equitable opportunities for access to science and its benefits, and opposes discrimination based on such factors as ethnic origin, religion, citizenship, language, political or other opinion, sex, gender identity, sexual orientation, disability, or age.

[www.icsu.org/freedom-responsibility/cfrs/statute-5](http://www.icsu.org/freedom-responsibility/cfrs/statute-5)

### ICSU's Promotion of Research Integrity

The raising of awareness for and the promotion of research integrity is part of the brief of the ICSU Committee on Freedom and Responsibility in the conduct of Science (CFRS), the guardian of the Universality of Science Principle. This element of

the Committee's work, documented on the ICSU website's "Freedom & Responsibility Portal,"(1) comprised co-sponsoring the three editions of the World Conferences on Research Integrity (WCRI) so far (Lisbon 2007, Singapore 2010, Montreal 2013). With the adoption of the "Singapore Statement on Research Integrity," (2) the conference in Singapore in 2010 was a significant achievement and success, also for CFRS and ICSU: the 230 participants endorsed this consensus document on globally applicable principles and responsibilities related to research integrity and scientific conduct. Based on last year's WCRI in Montreal, a statement on research integrity principles applied to cross-boundary research collaborations was adopted, which was equally supported by CFRS. (3)

Considering the nexus between science assessment and research integrity as a major emerging issue that demands attention from the science community, CFRS is further developing the discussion by elevating the matter to the systemic level. With this perspective, it already consented with the "San Francisco Declaration on Research Assessment" (4) that was adopted by a group editors and publishers of scientific journals in December 2012 and critically discusses the use of journal impact factors to measure scientific output to reward scientists and research institutions. In a recent initiative, CFRS jointly with the China Association for Science and Technology (CAST) and the Chinese Academy of Sciences (CAS) sponsored an international workshop in Beijing in April 2014, examining the links between science assessment and research integrity by consideration of the examples of the rapidly developing science systems in Brazil, China, and South Africa. (5)

### Science Assessment and Research Integrity

Fundamental to high quality science is the promotion of excellence through quality standards that include peer review of scholarly works and data as well as awards to recognize the highest achievements. As the science enterprise is growing and becoming increasingly competitive, additional measures to assess scientific output were developed by other stakeholders, e.g. journal publishers and science managers. These are mostly quantitative, notably metrics such as the citation and impact factors related to published research applied to individuals, journals, and institutions as well as ranking systems applied to institutions or countries.

The International Council for Science is concerned that the increasing weight of quantitative assessment

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over peer review could create a reward system that favours quantity of output over quality of output and thereby undermines scientific integrity by tempting scientists to use “shortcuts” to achieve high quantity output. Informed by the discussions at the workshop in Beijing mentioned above, the Council and its CFRS Committee make the following proposals to ameliorate the situation.

### Issues of Concern and Proposals for Amelioration

- **Purpose and evaluation parameters of assessments**  
Assessment methods and metrics are applied in different contexts, at the level of countries, institutions, disciplines, and individual scientists, while assessment results are used for different purposes, such as allocation of research funds, promotion of scholars or goal setting. Science assessments may

be helpful management tools, but it is critical that their purpose be defined transparently.

- **Align assessment output with science values and incentives**  
Quantitative assessments are generally based on easily measured dimensions such as output or citation volume. There needs to be attention given to measurement of less readily quantified factors such as impact on the discipline or relevance to society.
- **Science and science management needs**  
Many quantitative assessment systems were developed to facilitate the efficient allocation of scarce resources, rather than to reward merit. The science community needs to be involved more strongly in assessment systems, to ensure that there is concurrence between quantitative evaluations and evaluations based on rigorous and unbiased peer review. Assessment systems themselves should be periodically evaluated.

### IUPAC and ICSU—A Comment

by *Leiv K. Sydnes*

The focus on ICSU and its activity in *C/* is commendable. The article by David Black in the May-June 2014 issue presents ICSU's mission and gives an excellent condensed overview of the organization's focus and activities. In this issue, an example of what ICSU does and how the work is carried out is described in more detail by Roger Pfister, the secretary of ICSU's Committee on Freedom and Responsibility in the conduct of Science, which I chair.

As both these articles show, the Principle of Universality of Science is guiding ICSU's work. This principle should be well known, not only in IUPAC but in the science community in general. However, this is not the case in spite of the fact that all unions that are members of ICSU, like IUPAC, are expected not only to follow, but to defend the same principle when violations are discovered or suspected.

I will argue that the Principle of Universality is solidly embedded in all the regulations guiding IUPAC's activities, but overall I am sure we can do a lot more to draw attention to violations of the Principle in countries where IUPAC conferences and other meetings are being held. That does not mean that IUPAC should boycott countries where such violations are more or less obvious—such an act is itself a violation of the same principle, but by raising issues in a proper

way we increase the awareness and support individuals or groups in their struggle. For some violations, for instance prosecution and imprisonment of fellow scientists fulfilling their academic duties, such support is very important for the victims; for other violations, for instance fraudulent publication practices, it is just as important for us because our individual and collective awareness and sensitivity to such practices increase and make us less prone to the same practice.

However, my request for a more proactive role is not only aimed at IUPAC; most scientific unions have to increase their awareness considerably. The best way to start is to access ICSU's homepage at [www.icsu.org](http://www.icsu.org) and become educated and engaged. Then you will also learn about all the important multidisciplinary scientific work ICSU is facilitating and nourishing, where, as IUPAC President Mark Cesa said during the ICSU General Assembly in September 2014, in Auckland, there is a need for considerable involvement from the chemical community.

Let us get started and contribute to make ICSU better known in the scientific community—the sooner the better.

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- **Ranking systems for benchmarking only**  
Although ranking systems can provide valuable information on some dimensions of the scientific enterprise, they are inherently limited in capturing the full dimensions of science quality. Their use should be limited to benchmarking and goal setting.
- **Reward systems to incentivize research integrity**  
All assessment systems provide incentives for behavior. Quantitative metrics that focus on impact and citation factors may increase the pressure to rapidly produce scientific output. These conditions provide potential incentives to breach research integrity, for example in the form of multiple publications of the same data, fabricated, falsified or plagiarized data, honorary or even fraudulent authorship, all of which harm the scientific enterprise. The science community and science managers together need to discuss systemic measures to establish incentives that prevent such practices.
- **Education in research integrity**  
An understanding of the principles of research integrity and the behaviour that constitutes improper scientific conduct need to be taught and nourished during every phase of a scientist's education. Although there are socio-cultural differences between regions in the role of authority, originality, and responsibility within the scientific endeavour, these areas need to be addressed with consistent teaching of principles and codes of conduct at

higher education institutions around the world. Violations of research integrity need to be addressed within a preventative and educational framework.

## Continued Engagement

The International Council for Science will strive to engage its membership to ensure that research evaluation includes rigorous peer review and to support production incentives that foster research integrity. CFRS will continue its work in that direction, including by contributing to the 4<sup>th</sup> World Conference on Research Integrity in Brazil in 2015 (see conference announcement, page 31). 🇧🇷

👉 [www.wcri2015.org](http://www.wcri2015.org)

### Links/References

1. [www.icsu.org/freedom-responsibility](http://www.icsu.org/freedom-responsibility)
2. [www.singaporestatement.org/](http://www.singaporestatement.org/)
3. [www.wcri2013.org/doc-pdf/MontrealStatement.pdf](http://www.wcri2013.org/doc-pdf/MontrealStatement.pdf)
4. [www.ascb.org/dora-old/files/SFDeclarationFINAL.pdf](http://www.ascb.org/dora-old/files/SFDeclarationFINAL.pdf)
5. [www.icsu.org/news-centre/news/top-news/scientists-discuss-science-assessments-and-research-integrity-at-beijing-workshop](http://www.icsu.org/news-centre/news/top-news/scientists-discuss-science-assessments-and-research-integrity-at-beijing-workshop)

Dr. Roger Pfister <[roger.pfister@icsu.org](mailto:roger.pfister@icsu.org)> is Executive Secretary of ICSU Committee on Freedom and Responsibility in the conduct of Science (CFRS) and Head of International Cooperation at the Swiss Academy of Sciences, which hosts the CFRS Secretariat (2010-2015).

## Invitation to host the ICSU Secretariat for the Committee on Freedom and Responsibility in the conduct of Science (CFRS)

As a key ICSU policy committee, the Committee on Freedom and Responsibility in the conduct of Science (CFRS) safeguards and promotes the Principle of Universality of Science, one of the strategic priority areas of the International Council for Science ([www.icsu.org/freedom-responsibility](http://www.icsu.org/freedom-responsibility)). For its core activities, the Committee needs to rely on additional support. Support is sought in the form of a dedicated part-time Executive Secretary (0.4-0.5 full-time equivalent) to sustain the Committee's effectiveness in raising international awareness for, and to promote, freedom and responsibility aspects related to the conduct of science, in line with the Committee's terms of reference and work plan for 2014-2017. The tasks of the Executive Secretary involve preparing the biannual CFRS meetings, usually one in Paris and one outside Europe, and implementing the activities decided upon. Beyond drafting the meeting reports, the tasks include issuing of advisory documents, assisting in the organization of scientific meetings, interacting with the global scientific community on relevant matters and writing letters in support of scientists who are imprisoned or otherwise exposed to threats.

The candidate and/or the host institution would ideally already be involved in dealing with issues related to scientific freedom and responsibility and/or would be interested in an opportunity to expand this work internationally. Interpersonal skills and the ability for accurate communication and writing in English are essential, while a background in international relations and/or knowledge of the global science community would be assets.

All expressions of interest should be submitted to Rohini Rao ([Rohini@icsu.org](mailto:Rohini@icsu.org)) as soon as possible, and no later than Friday, 23 January 2015.

