Correspondence

Nobels, gender and ethnicity

As secretary-general of the Royal Swedish Academy of Sciences and secretary of the Nobel Committee for Chemistry, we share your concerns about the shortage of women and of scientists from outside Europe and North America among Nobel laureates (see *Nature* 574, 295; 2019).

However, you are incorrect in saying that we invite only "elite universities and academies" to nominate candidates for the Nobel prize. We make substantial efforts to approach research universities across the world. Each year, we request lists of faculty members from about 200 such universities, selected from some 1,600 institutions on a rotational scheme. We then send individual nomination forms to each professor.

The inequitable distribution of Nobel prizes is a symptom of a bigger problem. Science has been dominated by Western Europe and North America for centuries, and women have had limited scientific opportunities. For example, fewer than 15% of senior authors in *Nature* are women (Y. A. Shen *et al. Nature* 555, 165; 2018) and just 2% of your authors are from Africa, South America or western Asia (Nature Index 2019).

Our award process strives to ensure that all scientists get a fair chance, irrespective of geography or gender. As a small contribution, we are launching a programme of Nobel Symposia in Africa. But others must also work to improve the situation — by encouraging women to pursue science careers and by supporting research in low-income countries.

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India — science and social responsibility

India issued a draft national policy in September for social responsibility in science (see go.nature.com/32sihv2). Its aim is to strengthen the country's knowledge ecosystem, improve communication between science and society, and translate research into social benefits. A central agency and a national digital portal will oversee the policy's implementation, which is currently being widely discussed in the scientific community.

This policy for scientific social responsibility (SSR) is founded on scientists' ethical obligation to give back to society in return for the taxpayers' money that funds their research. It will promote scientific solutions for societal problems such as rural deprivation and the disempowerment of women, and improve scientific and technological support for industry. Funders will be expected to make SSR a condition for awarding grants.

India's scientific community is crucial for the implementation of the new policy. Researchers will be required to spend a minimum of 10 days every year in public engagement, and to share their knowledge, resources, data sets and equipment to accelerate the advancement of science. Credit for SSR efforts will be given to researchers in their performance evaluations.

Once this policy takes effect, India could lead the way in making science and scientists worldwide more socially responsible.

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Chile — right to free will needs definition

Chile could soon become the first country to incorporate 'neurorights' into its constitution to prevent the misuse of artificial intelligence and neurotechnology (see go.nature.com/35qdje5). These rights relate to the way in which mental processes can be monitored and influenced, principally through brain–computer interfaces.

The country's Senate has launched a project designed to protect five neurorights proposed by Rafael Yuste, a neurobiologist at Columbia University in New York City (see go.nature.com/33trrmc and R. Yuste *et al. Nature* 551, 159–163; 2017). These include the right to 'free will'. However, the precise meaning of free will should be carefully debated before it is incorporated as a national or international right.

Free will is a multidimensional concept that poses several unsolved philosophical problems. Most prominent is whether free will is compatible with determinism. Cultural diversity can also influence its interpretation (see N. Chernyak *et al. Dev. Psychol.* 55, 866–876; 2019). Furthermore, different types of free choice and action have already been included in the Universal Declaration of Human Rights (see articles 16.2, 18 and 21.3; go.nature.com/33t9bhn).

We should therefore work towards developing a consensual, minimal definition of free will. Although such a definition might not close the philosophical debate, it could be ethically operational in that it would help to pre-empt misinterpretations based on legislative loopholes.

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Test reproducibility of old computer code

We question whether analytical tools such as Common Workflow Language, which aim to make computational methods "reproducible and shareable", can stand the test of time (see *Nature* 573, 149–150; 2019). The long-term validity of computational results will not be testable if the original code cannot be run many years later.

Considering the rapidity of transformations in operating systems and programming languages, it is hard to predict the lifetime reproducibility of a particular code. We have therefore organized the Ten Years Reproducibility Challenge (see go.nature.com/2bwcukq). Researchers are invited to test code reproducibility by trying to rerun a code created for a scientific paper they published more than ten years ago. The codes can address any scientific domain (statistical analysis, numerical simulation or data processing, for example) and be written in any language.

The challenge closes in April 2020. Our hope is that the results will offer insights into long-term causes of non-reproducibility.

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