Correspondence

Western science diplomacy must rethink its biases

In their Essay, Roberto Lalli and Jaume Navarro highlight evolving attitudes towards science diplomacy over the past century (R. Lalli and J. Navarro *Nature* **633**, 515–517; 2024). This is an opportune moment to consider the future: earlier this year, the American Association for the Advancement of Science (AAAS) and the Royal Society in the United Kingdom released a joint call for suggested revisions to their 2010 document, *New Frontiers in Science Diplomacy*.

As conceived by Western nations, science diplomacy has often exacerbated existing power imbalances, or operated tokenistically. In the AAAS and Royal Society framework, for instance, the Islamic world is referenced mainly through Western-funded projects or by focusing on Western-aligned states. Global initiatives such as the Mustafa Prize, a scientific award administered by Iran, receive very limited attention in the West.

Current world events, including Western countries' differing responses to Russia's actions in Ukraine and Israel's in Gaza, complicate matters further. Now is the time for Western science diplomacy to reinvent itself with a truly global focus: by critically assessing its institutional and historical biases; by treating all states, including those not aligned with Western interests, as equal partners; and by lobbying for progressive diplomatic stances on humanitarian crises wherever they occur.

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Ukraine's experience with distributed peer review

You report trials of distributed peer review — in which researchers vet grant proposals as a condition for having their own considered — in various research settings (see *Nature* https://doi.org/npjh; 2024). Ukraine has applied this model for many years to evaluate state-funded research projects. This has demonstrated the advantages of the approach and how to mitigate risks such as conflicts of interest and competitive biases.

In the Ukrainian model, research proposals are evaluated independently by five specialists. Reviewers from the same institution as the applicant are excluded. The highest and lowest scores are automatically discarded to prevent outliers skewing the results, and significant deviations from the average score are reviewed by an ethics commission established for this purpose.

This year, Ukraine also formed a unified pool of experts to judge all grant competitions. Managed through an electronic system, this reduces the burden of finding appropriate specialists, ensuring that applications for different grant opportunities can be reviewed in shorter time frames. We invite international researchers to join this pool (see https://t1.nauka.gov.ua/en) to support the advancement of science in Ukraine at a crucial time for the country's scientific community.

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On the importance of fungi …

Dasheng Liu observes how taxonomy teaching and research has declined, with devastating consequences for biodiversity conservation (D. Liu *Nature* **633**, 741; 2024). He refers to how "credit hours for botany and zoology modules have halved at many universities in China".

We would like to make a plea for mycology — the study of fungi — to be put on an equal footing with botany and zoology. The teaching of mycology is rare in university curricula. When taught, it is often subsumed into botany courses, despite fungi forming their own taxonomic kingdom.

This plea is more than a mycologist's quibble. Unlike many animals and plants, most fungi are invisible to the naked eye, uncharismatic and evoke fear or disgust. As a result, mycology is underfunded, struggles to attract young scientists and is under-represented in conservation. A mere 0.5% of described fungal species have been assessed for the International Union for Conservation of Nature's Red List of Threatened Species.

Promoting mycology as a standalone discipline is urgent, as are efforts to render fungal taxonomy more appealing as a field. Otherwise, integrating one of the most hyperdiverse and ecologically important areas of biodiversity into global conservation agendas will remain illusory.

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… and the ants that depend on them

In 1874, *Nature* published a book review by the biologist Alfred Russel Wallace of *The Naturalist in Nicaragua*, in which author Thomas Belt hypothesized that leafcutter ants cultivate fungi in their nests (A. R. Wallace *Nature* **9**, 218–221; 1874). Later that year, it published a letter from German biologist Fritz Müller to Charles Darwin, confirming that leafcutter ants rely on fungal symbionts to digest the plant material they collect (F. Müller *Nature* **10**, 102–103; 1874).

Since then, 150 years on, fungus-farming ants have become a model system of obligate mutualistic symbiosis, in which species depend entirely on one another for survival. This system also encompasses fungal pests, protective bacteria, co-evolved social parasites, gut bacteria and mycoviruses.

Three decades ago, the first molecular-phylogenetic study tracing the co-evolutionary dynamics of ants and their fungal partners appeared (I. H. Chapela *et al. Science* **266**, 1691–1694; 1994). It was followed this year by the first reliable co-phylogeny (T. R. Schultz *et al. Science* **386**, 105–110; 2024) and a high-quality genome of a fungal cultivar (C. A. Leal-Dutra *et al. Mol. Bio. Evol.* **41**, msae197; 2024). Such history shows how observations of early naturalists continue to fuel modern advances in evolutionary biology, ecology and genetics, yielding a deeper understanding of the forces of natural selection that shaped obligate mutualisms.

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