Correspondence

Protect Antarctic ecosystems from growing tourism

Participants at the 46th Antarctic Treaty Consultative Meeting, held in Kochi, India, in May, agreed on the need to regulate tourism to the Antarctic, in the face of record visitor numbers (see *Nature India* https://doi.org/10.1038/d44151-024-00097-5; 2024).

The surge has potentially huge implications for the continent's environment and biosecurity. Tourist activities disturb the behaviours and habitats of local marine and land animals. Vessel movements can wound whales, and the noise can disrupt the foraging and communication of dolphins. Repeated encounters with wildlife — particularly penguins, seals, humpback whales and orcas — during their crucial breeding seasons stunt wildlife breeding success and cause population shrinkage (C. J. Hogg *et al. Nature* **586**, 496–499; 2020). Travellers bringing pathogens, pharmaceuticals and microplastics with them could further devastate wildlife populations.

Tourism's effects on Antarctica should be promptly evaluated to provide guidelines for tourism operations there. An independent body is needed to oversee tourism beyond the current system of self-regulation. Only such coherent efforts can safeguard Antarctica's pristine ecosystems for generations to come.

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Rethink the health benefits of exercise in a warming world

The study by the Molecular Transducers of Physical Activity Consortium (MoTrPAC) on the metabolic consequences of physical exercise is a remarkable achievement (*Nature* **629**, 174–183; 2024). But climate change means that ambient temperature during exercise is a factor that merits further research.

According to the MoTrPAC study, exercise improves health through various molecular and cellular pathways, reducing the risk of numerous diseases. Yet it is firmly established that exercise in hot environments increases the risk of exercise-associated muscle cramps, heat syncope, exhaustion, heat injury and exertional heat stroke (D. J. Casa *et al. J. Athl. Train.* **50**, 986–1000; 2015). The influence of these conditions on human metabolism cannot be overlooked. When exercising in a hot environment, molecular and cellular pathways might differ from those at room temperature.

A more detailed understanding of these pathways during exercise in hot conditions would significantly enhance our knowledge of exercise physiology. Including ambient temperature in future metabolic research would provide a more comprehensive and integrative perspective on how the body responds to exercise under varying thermal conditions.

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To explain sex, look to evolution

Nature's recent Editorial and collection of opinion articles on sex and gender in research (see go.nature.com/3zef6hg) would have benefited from greater attention to evolutionary biology and the definition of sex by anisogamy, or differing gamete size. In the words of evolutionary biologist Joan Roughgarden in her book *Evolution's Rainbow* (Univ. California Press, 2013): "To a biologist, *"male" means making small gametes, and "female" means making large gametes*. Period!"

This definition avoids the 'sex binary' that concerns so many people. Some organisms produce both male and female gametes, and others produce different gametes at distinct life stages or under various conditions. Organisms can be male, female, both at the same time, male at one time and female at another, or have no clear and unambiguous sex. The definition also implies that there are no essential or universal male or female phenotypes: male pipefish gestate their embryos and female jacana birds fight over mates, for example.

Anisogamy is at the heart of the modern theory of why sexes evolved and why they show such extraordinary diversity. Neglecting it makes the varied phenotypic expression of sex, and its interaction with gender in humans, seem unmanageably complex. As with so much of biology, sex makes better sense when viewed in the light of evolution.

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