



## LETTERS

edited by Jennifer Sills

### Saving African Lions



THE TRUTH ON AFRICAN SOIL IS DIFFERENT FROM THE OPINIONS formed by J. Guo and experts interviewed for the News Focus story “Will captive breeding save Africa’s king of beasts?” (17 April, p. 331). The planned reintroduction programs do not involve lions cowed with sticks to ensure compliant behavior during a wilderness stroll with picture-posing tourists. The African Lion and Environmental Research Trust (ALERT) is certainly not following a “standard reintroduction protocol”—rather, it uses a highly innovative and experimental procedure constantly and objectively evaluated for effectiveness.

The inescapable facts are that lions are a bit thin on the ground at the present time, the great majority of protected areas in Africa are depopulated in terms of lions, and ALERT has received a great number of expressions of interest from various African government bodies to restore lion populations, and thereby system biodiversity and function, in such areas.

ALERT has a unique approach to restoring such populations. Others might opine that this constitutes no more than a drop in the bucket, but we believe that is better than the present empty container.

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### A Standardized Response to Biological Invasions

THE POLICY FORUM “WILL THREAT OF BIOLOGICAL INVASIONS UNITE THE EUROPEAN UNION?” (P. E. Hulme *et al.*, 3 April, p. 40) emphasized the major regulatory and political challenges faced by European institutions. However, they are not alone in facing the tremendous threat of biological invasions; this is a global challenge with infrastructure needs described nearly a decade ago (1). Hulme *et al.* emphasized that the perspective of Europe as the source, rather than recipient, of invasive alien species (IAS) needs revision. Other continents and countries face similar challenges. For example, as major forces in the world economy, China and the United States import and export substantial quantities of goods, which makes these two nations leading sources and recipients of IAS (2). However, inadequate funding, inappropriate methodology, and inconsistent data assembly have precluded generation of IAS invento-

ries and have rendered conclusions about the percentage of IAS in the total flora and fauna of a region ambiguous. The number of information networks devoted to IAS is increasing globally, which may help to integrate IAS research at all scales, particularly if data sharing and compatibility can be improved. However, standardized information and technological platforms to share such information are lacking (3).

The concept of the European Centre for Invasive Species Management (ECISM), proposed by Hulme *et al.*, could be extrapolated to all of the continents and adopted by every country with standardized methodology and scientific initiatives, much as the BioNET Locally Owned and Operated Partnerships are facilitating global collaboration in taxonomy (4). National and regional networks to share invasive species information should also freely share standardized tools, as is the goal of the Invasives Information Network of the Inter-

American Biodiversity Information Network and the Global Invasive Species Information Network (5).

Combating the menace of invasions in a particular continent is not sufficient to manage this important global issue.

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#### Response

THE RECENT AVAILABILITY OF CONTINENT-WIDE data on alien species, their pathways of entry, and probable impacts on the environment and economy (1) provide a strong platform on which to build a European strategy on invasive species (2). However, appropriate databases alone are not enough. Neither New Zealand nor Australia have access to the breadth of data now available to Europe, but through dedicated government agencies, these two countries invest heavily in border biosecurity and the management of alien invasions. For this reason, we recommend that the European Parliament consider establishing a single agency, the European Centre for

#### Letters to the Editor

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Invasive Species Management (ECISM), which will not only continue to update and manage the European alien species inventory but also provide advice, target new research, coordinate surveillance and response, identify emerging threats, support training, and increase public awareness (3).

The aims of a global information network are certainly laudable (4), but the focus has been on appropriate cyber-infrastructure rather than on applying the information to mitigate the effects of biological invasions (5). In the United States, more than 300 invasive species databases exist, more than half of which are online (6), yet under the National Invasive Species Management Plans, integration of this information through a single portal is not a goal (7). Invasive species databases, such as the Delivering Alien Invasive Species Inventories for Europe (DAISIE) Web portal (8), work best when they are designed to target the specific needs of regulatory and legislative institutions responsible for addressing threats to the environment, human health, or the economy (9). Once databases have been optimized to address management responsibilities and policy concerns, they can be further utilized to influence global international organizations such as the World Trade Organization (WTO). This pivotal link between alien species data and policy response is not explicit in current efforts to develop a global invasive species database (4, 5). The outcome of the current discussions about a European invasive species strategy will not only send signals to other nations regarding the way forward on these issues, but will also clarify the future prospects of a globally supported strategy on invasive species.

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## Neuroscientists Need Neuroethics Teaching

WITH THE ADVANCEMENT OF NEUROSCIENCES in recent years, there is a growing need to ensure that its students are educated in applied neuroethics as part of their formal studies. However, neuroethics education is not commonly an integrated part of neuroscience training. Discussions we have had with members of the Russell group, an association of the 20 major research-intensive universities in the United Kingdom, indicate that the majority of their neuroscience students do not receive formal neuroethics teaching.

Neuroscience research findings have begun to have far-reaching ethical implications on education, treatment, and even the law. For example, ascertaining that cognitive enhancing drugs not only improve performance in neuropsychiatric groups, but may also enhance cognition in young healthy adults has raised

concerns and debate about the safety, access, and equity in education, work, and academic settings where taking drugs for enhancement purposes is becoming increasingly widespread (1, 2). Functional magnetic resonance imaging has been used to identify residual cognitive function and conscious awareness in patients assumed to be in a vegetative state, yet who retain cognitive abilities that have evaded detection using standard clinical methods (3). Several companies offer neuromarketing and brain-based lie-detection services, which has raised concerns from the academic community at large about the use and misuse of neuroscientific results (4).

Neuroethical issues are surely going to become ever more pertinent with new developments in imaging analysis techniques, the simultaneous integration of multiple neuroimaging systems, and the linking of genetics with imaging. Although we realize that both students and lecturers are often plagued with already challenging schedules, we propose that as standard good practice, academic departments should ensure that mechanisms are in place for teaching neuroethics. A solid education in the neurosciences should encompass the ability to consider the ethical implications of one's research. Such an education will ultimately also promote future neuroscientists integrating socially relevant questions into their research and ensuring from an early stage that the public at large is supportive of advances in neuroscience.

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### CORRECTIONS AND CLARIFICATIONS

**Books et al.:** "Pages to turn on a lazy day" (5 June, p. 1267). Contributor Barbara Fischer's affiliation was incorrect. She is at the University of Bern.

**Perspectives:** "What determines coral health?" by V. M. Weis and D. Allemand (29 May, p. 1153). The affiliation of Denis Allemand was incomplete. It should have read: "Centre Scientifique de Monaco, Avenue Saint-Martin, MC 98000 Monaco, Principality of Monaco, and Faculty of Science, University of Nice-Sophia Antipolis, F 06108 Nice Cedex 2, France. E-mail: allemand@centrescientifique.mc." The figure credit for panels D and E was incorrect. It should have read: "Panels D and E taken at Centre Commun de Microscopie Electronique, University of Nice-Sophia Antipolis."

**Books et al.:** "Three takes on people and water" (1 May, p. 593). The film *Blue Gold* was produced in the United States, and Ireen van Ditschuyzen's film is *Onze Kust* (Our Coast).

**Reports:** "Green evolution and dynamic adaptations revealed by genomes of the marine picoeukaryotes *Micromonas*" by A. Z. Worden *et al.* (10 April, p. 268). The affiliation listed for authors Panaud and Piegu was incorrect. They are at the Laboratoire Genome et Développement des Plantes, UMR CNRS/Institut pour la Recherche et le Développement/University of Perpignan Via Domitia, Université de Perpignan, 66860 Perpignan, France.

**Reports:** "A recessive mutation in the APP gene with dominant-negative effect on amyloidogenesis" by G. Di Fede *et al.* (13 March, p. 1473). The fourth sentence of the penultimate paragraph (p. 1476) of the main text describes a mutation at codon 673. The amino acid change should be Ala<sup>673</sup> to Thr<sup>673</sup> (A673T) rather than Ala to Tyr.

**Reports:** "Conductance of a single conjugated polymer as a continuous function of its length" by L. Lafferentz *et al.* (27 February, p. 1193). In addition to Leonhard Grill, Stefan Hecht (sh@chemie.hu-berlin.de) may be contacted as a corresponding author.

**Reports:** "DNA from pre-Clovis human coprolites in Oregon, North America" by M. T. P. Gilbert *et al.* (9 May 2008, p. 786). There were typographic errors in rows 5 and 6 of the second column (labeled Hg) in Table 1. In row 5, B§,§§ should have been B2§. In row 6, B2† should have been B†§§. The authors acknowledge H. Poinar, S. Fiedel, C. King, A. Devault, K. Bos, M. Kuch, and R. Debruyne for pointing out the error.

### TECHNICAL COMMENT ABSTRACTS

#### COMMENT ON "DNA from Pre-Clovis Human Coprolites in Oregon, North America"

Hendrik Poinar, Stuart Fiedel, Christine E. King, Alison M. Devault, Kirsti Bos, Melanie Kuch, Regis Debruyne

Gilbert *et al.* (Reports, 9 May 2008, p. 786) analyzed DNA from radiocarbon-dated paleofecal remains from Paisley Cave, Oregon, which ostensibly demonstrate a human presence in North America predating the well-established Clovis complex. We question the authenticity of their DNA results and argue that in the absence of intact stratigraphy and diagnostic artifacts, and in view of carbon isotope anomalies, the radiocarbon dates of the oldest specimens are unreliable.

Full text at [www.sciencemag.org/cgi/content/full/325/5937/148-a](http://www.sciencemag.org/cgi/content/full/325/5937/148-a)

#### RESPONSE TO COMMENT BY POINAR *ET AL.* ON "DNA from Pre-Clovis Human Coprolites in Oregon, North America"

M. Thomas P. Gilbert, Dennis L. Jenkins, Thomas F. G. Higham, Morten Rasmussen, Helena Malmström, Emma M. Svensson, Juan J. Sanchez, Linda Scott Cummings, Robert M. Yohe II, Michael Hofreiter,

#### Anders Götherström, Eske Willerslev

The arguments of Poinar *et al.* neither challenge our conclusions nor would contribute to the verification of our data. We counter their questions about the authenticity of our ancient DNA results and the reliability of the radiocarbon data and stand by the conclusion that our data provide strong evidence of pre-Clovis Native Americans.

Full text at [www.sciencemag.org/cgi/content/full/325/5937/148-b](http://www.sciencemag.org/cgi/content/full/325/5937/148-b)

#### COMMENT ON "DNA from Pre-Clovis Human Coprolites in Oregon, North America"

Paul Goldberg, Francesco Berna, Richard I. Macphail

Gilbert *et al.* (Reports, 9 May 2008, p. 786) presented DNA analysis of coprolites recovered from an Oregon cave as evidence for a human presence in North America before the Clovis culture. Results of our micromorphological and Fourier transform infrared spectroscopy analyses of one of the reported coprolites are difficult to reconcile with the DNA results identifying the coprolite as human.

Full text at [www.sciencemag.org/cgi/content/full/325/5937/148-c](http://www.sciencemag.org/cgi/content/full/325/5937/148-c)

#### RESPONSE TO COMMENT BY GOLDBERG *ET AL.* ON "DNA from Pre-Clovis Human Coprolites in Oregon, North America"

Morten Rasmussen, Linda Scott Cummings, M. Thomas P. Gilbert, Vaughn Bryant, Colin Smith, Dennis L. Jenkins, Eske Willerslev

Goldberg *et al.* use data from micromorphological and Fourier transform infrared analyses to argue that Paisley Cave pre-Clovis coprolite 1374-5/5D-31-2 is of herbivore, rather than human, origin. We argue that the diagnostic capability of the techniques used by Goldberg *et al.* are limited, and we present new genetic data that support our original claims.

Full text at [www.sciencemag.org/cgi/content/full/325/5937/148-d](http://www.sciencemag.org/cgi/content/full/325/5937/148-d)



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