

Faith against illness

1636



Breeding perennial grains

1638



SPORE Essay

1648



LETTERS | BOOKS | POLICY FORUM | EDUCATION FORUM | PERSPECTIVES

LETTERS

edited by Jennifer Sills

Time for a Sea Change in Chinese Collaboration

THE EXCAVATION OF *NANHAI 1*, A SONG DYNASTY SHIP OFF THE COAST OF CHINA BY RESEARCHERS based in Guangzhou, Guangdong Province (News Focus, L. Jiao, “Unprecedented excavation brings Maritime Silk Road to life,” 23 April, p. 424) is one of the most exciting recent developments in research on Song Dynasty seagoing trade and technology. Scholarship on this topic has been under way for decades. In 1974, a Song Dynasty ship was unearthed and studied in Quanzhou, Fujian Province. In combination with many other sources of evidence, the find provided rich information on China’s early engagement with other societies (1, 2).



Experts from and on Quanzhou should have a part in the *Nanhai 1* research. Unfortunately, collaboration between cities in China can be especially difficult, both in research and education. As an urban planner who has worked for 17 years on historic preservation in Quanzhou, I have observed

the city’s efforts to obtain UNESCO World Heritage status on the basis of its importance to China’s Maritime Silk Road, an effort in which no Chinese city has yet succeeded. UNESCO encourages multiple jurisdictions to apply together for one “property” when the heritage is extended across many geographic locations. To be successful, the Chinese central government must do more to facilitate collaboration among Quanzhou, Guangzhou, and other port cities in China and abroad that contributed to the trade.

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References

1. The Song Dynasty in China (<http://afe.easia.columbia.edu/song/out/trade.htm>).
2. R. Pearson, L. Min, L. Guo, *Int. J. Hist. Archaeol.* 6, 23 (2002).

Benefits of Self-Reporting

W. F. LAURANCE AND O. VENTER (“MEASURING forest changes,” Letters, 30 April, p. 569) question whether, under the proposed REDD mechanism (reducing emissions from deforestation and forest degradation), developing countries should be responsible for producing their own estimates of changes in forest carbon stocks. Instead, they propose that an independent organization should be given this task, and mention the UNEP World Conservation Monitoring Centre as a possible candidate for this role.

We note that the practice within the

framework convention on climate change (UNFCCC) has been that countries report, in accordance with specified standards, on their own greenhouse gas emissions (1). Independent review teams composed of experts nominated by the Parties then verify that country reports correctly apply the IPCC methodology for estimating emissions (2).

There are strong indications that the Parties to the UNFCCC will follow a similar approach for REDD (3, 4). Each independent review team is mandated to make use of “technical information” from third parties. Ensuring that the teams have access to any available independent forest monitoring data

would strengthen the verification process.

This approach has the merit of promoting the development of accurate monitoring systems within countries, which are themselves an important component of good forest management, while also retaining a strong element of independent verification. For these reasons, we suggest that Laurance and Venter’s proposal to replace developing countries’ role in the process may not be in the long-term interests of promoting reduced emissions from forests in developing countries.

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References

1. “Updated UNFCCC reporting guidelines on annual inventories following incorporation of the provisions of decision 14/CP.11” (UNFCCC Subsidiary Body for Scientific and Technological Advice, FCCC/SBSTA/2006/9, 2006); unfccc.int/resource/docs/2006/sbsta/eng/09.pdf.
2. “Review of the implementation of commitments and of other provisions of the Convention. National communications: Greenhouse gas inventories from Parties included in annex I to the Convention” (UNFCCC Conference of the Parties, FCCC/CP/2002/8, 2003); unfccc.int/resource/docs/cop8/08.pdf.
3. A. Angelsen *et al.*, *Reducing Emissions from Deforestation and Forest Degradation (REDD): An Options Assessment Report* (Meridian Institute, Washington, DC, 2009); www.REDD-OAR.org.
4. D. J. Baker *et al.*, *Environ. Sci. Pol.* 13, 249 (2010).

Consequences of Legal Ivory Trade

THE POLICY FORUM BY S. WASSER *ET AL.* (“Elephants, ivory, and trade,” 12 March, p. 1331) overlooks several points that bear on the issue of whether the Convention on International Trade in Endangered Species (CITES) should allow legal ivory sales.

There is no proof that the elephant population is dropping. The two citations given offer no clear evidence. The IUCN Red List categorizes *Loxodonta africana* as “vulnerable,” below two levels of higher threat, and

its population trend is described as “increasing” (1).

We agree with the statement that “most of Africa lacks adequate controls for protection of elephants,” but rather than target legal ivory sales, CITES should take steps to increase anti-poaching and trade enforcement. Legal ivory sales have not been shown to stimulate poaching (2–4), despite widespread media claims that link the two. Focus on this issue takes attention away from other factors that drive illegal killings, such as unregulated domestic markets, ivory demand, corruption, and human–elephant conflict.

Wasser *et al.* state that “[i]n the absence of data, precautionary principles should be applied.” Yet precautionary principles can be manipulated to suit one’s purposes. The authors assume that a legal trade might lead to irreversible elephant losses. What if the assumption were the opposite—that not allowing trade would lead to increased poaching? This scenario is hardly far-fetched. In the absence of legal supply, ivory demand will inevitably be met by killing elephants illegally.

The authors state, accurately, that “one-off” sales introduce uncertainty into the marketplace, but they do not acknowledge

that there is another way to reduce uncertainty other than having no sales: Allow a regular, annually recurrent sale to settle the markets, reduce prices, and lower motivation to poach and buy illegal ivory.

We believe that both no sales and “one-off” sales are harmful for elephant conservation and, given sufficient institutional support and political will, a normalized legal ivory trade would save elephant lives.

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References

1. The IUCN Red List of Threatened Species, *Loxodonta africana* (www.iucnredlist.org/apps/redlist/details/12392/0).
2. D. Stiles, *Environ. Conserv.* **34**, 309 (2004).
3. E. Bulte, R. Damania, G. van Kooten, *J. Wildlife Manage.* **71**, 613 (2007).
4. T. Milliken, R. W. Burn, L. Sangalaku, *The Elephant Trade Information System (ETIS) and the Illicit Trade in Ivory* (CoP15, Doc. 44.1, TRAFFIC, Cambridge, MA, 2009); www.cites.org/eng/cop/15/doc/E15-44-01A.pdf.

Response

WALKER AND STILES ARGUE THAT ELEPHANT populations are not declining. The facts say otherwise. *Loxodonta africana* numbers have

plummeted by more than 50% continent-wide in the past 40 years, a reduction now compounded by increases in range loss, conflict with humans, and resurgence in poaching (1). Illegal killing from 2000 to 2007 was highest in central Africa (63% of carcasses were illegally killed) followed by eastern (57%), western (33%), and southern Africa (19%) (2). Poaching reduced one of the Democratic Republic of the Congo’s (DRC’s) largest populations of forest elephants by nearly half between 1996 and 2006 (3). Elephant populations in Chad and Central African Republic declined by more than 80% in the past 5 and 20 years, respectively (4, 5). The Selous Game Reserve population in Tanzania has declined by 30% since 2006, amidst escalated poaching (2, 6). Because average tusk size has progressively decreased over the past three decades (7, 8), more elephants must be killed for the same volume of ivory; this has accelerated the trend toward population collapse.

Walker and Stiles next argue that legal trade does not increase illegal trade, and CITES should focus on enforcement instead of targeting legal trade. We disagree. The appeal of the market mechanism for managing wildlife stocks presumes well-functioning institutions with unambiguous ownership of the stocks. Chronic problems such as poaching, corruption, and inadequate regulation and enforcement capacity show that this assumption is false. The problem will be exacerbated if CITES’ promotion of legal trade increases illegal trade by signaling an opening market. The ETIS (9) report to CITES rejected such a relationship for the first one-off ivory sale in 1999 but acknowledged that illegal ivory trade increased substantially in 2009 after the 2008 sale. The Elephant Trade Information System (ETIS) analysis used adjusted amounts of seizures that markedly differed from unadjusted values, incorporated a smoothing technique that blunted peaks and troughs, and excluded a major increase in poaching in DRC during 2004 (10). This obscured a recurring pattern where each proposal for one-off ivory sales appears to have instigated a rise in poaching.

Walker and Stiles believe that a regular, legal trade should be established and enforced. We are not suggesting that legal sales will always lead to irreversible losses, but rather that illegal trade currently is too uncontrolled to justify the risk. When the distinction between legal and illegal ivory is uncertain, increasing the legal supply raises the probability that more ivory will be provided through illegal trade. Illegal dealers will see an expanding market due to increased allowable trade, and will endeavor to maintain their share of that market. Moreover, growing demand for ivory will outstrip

CORRECTIONS AND CLARIFICATIONS

News Focus: “The coastal Indus looks west” by A. Lawler (28 May, p. 1100). The story incorrectly identified two distances on page 1100. Lothal is approximately 250 kilometers from Dholavira, which in turn is approximately 650 kilometers from Mohenjo Daro. In addition, Kanmer dig director Toshiki Osada is at the Research Institute for Humanity and Nature in Kyoto, which is part of the National Institutes for the Humanities, based in Tokyo. Also, the subheadline on page 1100 should have read that the Indus society shipped goods to the west, not the east.

News Focus: “Laser fusion energy poised to ignite,” by D. Clery (14 May, p. 808). Hiroshi Azechi’s statement that “NIF will prove that ignition takes place at laboratory temperatures, irrespective of the heating method” should read “NIF will prove that ignition takes place in laboratories, irrespective of the heating method.”

Reports: “Altered histone acetylation is associated with age-dependent memory impairment in mice” by S. Peleg *et al.* (7 May, p. 753). There were 2229 genes, but the text misstates the numbers that were up-regulated and down-regulated. It should have read, “In 3-month-old mice, 2229 genes (1977 up-regulated versus 252 down-regulated) were differentially expressed.” The body of table S1 is correct, but the title contains the same mistake.

TECHNICAL COMMENT ABSTRACTS

Comment on “30,000-Year-Old Wild Flax Fibers”

C. Bergffjord, S. Karg, A. Rast-Eicher, M.-L. Nosch, U. Mannering, R. G. Allaby, B. M. Murphy, B. Holst

Kvavadze *et al.* (Brevia, 11 September 2009, p. 1359) identified fiber samples as 30,000-year-old flax based on a comparison with modern flax fibers analyzed by compound microscope and on the presence of dislocations/nodes in the fibers. We argue that this evidence is not sufficient to identify the fibers as flax.

Full text at www.sciencemag.org/cgi/content/full/328/5986/1634-b

Response to Comment on “30,000-Year-Old Wild Flax Fibers”

Eliso Kvavadze, Ofer Bar-Yosef, Anna Belfer-Cohen, Elisabetta Boaretto, Nino Jakeli, Zinovi Matskevich, Tengiz Meshveliani

Bergffjord *et al.* express doubts regarding our identification of flax fibers on the basis of the morphology of their internal layers. The authors use microphotographs and descriptions of the outer layers of fibers as arguments for their claims. Morphology and structure of the outer and inner parts of fibers are radically different, however, rendering their reservations misplaced.

Full text at www.sciencemag.org/cgi/content/full/328/5986/1634-c

any potential sustainable legal supply given increasing purchasing power of Asian consumers and limited maximum growth rates of elephant populations, particularly when poaching is already mining populations of progressively younger individuals. If seizures are assumed to represent $\leq 10\%$ of ivory shipped (11), the average 19,000 kg of annual ivory seizures over the past decade (9) would require 190,000 kg of “legal” ivory sold annually just to meet levels of demand presently supplied through illegal trade.

We contend that any legal trade at this time is an untenable risk that complicates law enforcement and distracts from the need to reduce demand. Although reducing demand is possible, elephants could be seriously depleted in the interim because (i) verified natural mortality and controlled culls are insufficient to meet current demand; (ii) proceeds from ivory sales cannot be guaranteed to return to local communities as incentive for in situ conservation; and (iii) education campaigns are finding it difficult to suppress the growing desire and purchasing power for luxury goods in end-user countries.

Analogous arguments apply to most other trade species, including sharks, blue fin tuna,

polar bears, and corals. CITES should therefore reset its priorities, more explicitly apply the precautionary principle, and insist upon open data access and peer review. Only then will it ensure the long-term viability of species and trade.

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References and Notes

1. J. J. Blanc *et al.*, *African Elephant Status Report 2007* (IUCN, Gland, Switzerland, 2007).
2. CITES, “Monitoring of illegal hunting in elephant range states” (CoP15, Doc. 44.2, 2009); www.cites.org/eng/cop/15/doc/E15-44-02.pdf.
3. R. Beyers, thesis, University of British Columbia, Vancouver, BC (2008); <https://circle.ubc.ca/handle/2429/960>.
4. P. Bouché *et al.*, *Afr. J. Ecol.*, 10.1111/j.1365-2028.2009.01202.x (23 December 2009).
5. D. Potgieter, N. Taloua, B. Djimet, M. Fay, L. Holm, *Dry Season Aerial Total Count, Zakouma National Park, Chad*

4–8 March 2009 (Wildlife Conservation Society Technical Report, 2009).

6. CITES, “Report of the Panel regarding the proposal of the United Republic of Tanzania” (CoP15 Doc. 68 A6a); www.cites.org/eng/cop/15/doc/E15-68A06a.pdf.
7. E. J. Millner-Gulland, J. R. Beddington, *Proc. R. Soc. London Ser. B* **252**, 29 (1993).
8. CITES, “Report of the Panel regarding the proposal of Zambia” (CoP15 Doc. 68 A6b); www.cites.org/eng/cop/15/doc/E15-68A06b.pdf.
9. T. Milliken, R. W. Burn, L. Sangalaku, *The Elephant Trade Information System (ETIS) and the Illicit Trade in Ivory* (CoP15, Doc. 44.1, TRAFFIC, Cambridge, MA, 2009); www.cites.org/eng/cop/15/doc/E15-44-01A.pdf.
10. C. A. Apobo, *Rapport sur le Braconnage D’Éléphant et sur le Commerce de l’Ivoire dans et la Périphérie de la Réserve de Faune à Okapi (RFO) Ituri, RDC* (ICCN Report, Wildlife Conservation Society, Democratic Republic of Congo, 2004).
11. S. K. Wasser *et al.*, *Conserv. Biol.* **22**, 1065 (2008).

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