



LETTERS

edited by Jennifer Sills

A World with Corals: What Will It Take?

IF THE ARTICLE "A WORLD WITHOUT CORALS?" (NEWS FOCUS, R. STONE, 4 MAY, P. 678) LEFT YOU reaching for a stiff drink, you are not alone. The measures required to limit climate change can seem an eternity away to coastal communities left to deal with the consequences. Yet, since the 1997–98 mass bleaching—an unforgiving global event that destroyed 16% of the world's coral reefs—practitioners and scientists have worked to identify meaningful actions that can promote reef survival in the face of climate change.

We believe it is more useful to ask, "What would it take to have a world with corals?" In this respect, the community responsible for the sustainable management of reefs has recently produced a series of consensus viewpoints (1–3). The emerging agenda stresses the need for a two-pronged approach: (i) global actions to reduce climate change and (ii) local actions to support ecosystem resilience.

The challenge of achieving international action on climate should not overshadow the significance of local interventions. Growing evidence suggests that local management will assist coral reefs through the period where we, as a global society, struggle to stabilize Earth's atmosphere. Strategies as broad as retaining herbivores (4), protecting naturally resilient areas (e.g., the sidebar "Palau combats coral bleaching," C. Pala, 4 May, p. 680), and maintaining conditions for coral recruitment (5) appear to be effective for shoring up the resilience of reefs in preparation for the next 100 years of stress.

Although the current greenhouse trajectory is disastrous for coral reefs and the millions of people who depend on them for survival, we should not be lulled into accepting a world without corals. Only by imagining a world with corals will we build the resolve to solve the challenges ahead. We must avoid the "game over" syndrome and marshal the financial, political, and technical resources to stabilize the climate and implement effective reef management with unprecedented urgency.

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Pseudoscience in Bosnia

IN THE NEWSMAKERS ITEM "DIGGING FOR pride" (27 July, p. 435), Bosnian Prime Minister Nedžad Brankovic is quoted as asking, "Why don't we recognize something that is visible to the naked eye?" An answer to his question is that Semir Osmanagic and his colleagues have so far failed to publish, in a peer-reviewed journal, a credible case that the ruins of a monument-constructing "supercivilization" are anything other than a haphazard collection of jointed bedrock, Leisegang banding, sole marks, concretions, and other geologic features mixed in with some unrelated medieval, Roman, and other artifacts and ruins (1).

For example, Osmanagic and his colleagues claim that giant, meter-scale, "stone balls" found near Zavidovici, Bosnia and Herzegovina, are man-made artifacts related to a Bosnian "supercivilization." Examination of petrographic thin sections of recently obtained samples of the Zavidovici "stone balls" and the bedrock that originally enclosed them found that they consist of litharenite (2). Typical thin sections of the "stone balls" exhibit pervasive carbonate cement, including poikilotopic calcite spar. The calcite cement has often replaced framework grains. The bedrock, either from which these objects came or in which they are still partially encased, consists of litharenite almost identical in composition to these spherical to subspherical boulders. Local bedrock differs from these objects in that it typically lacks the strongly developed carbonate cement. Their carbonate cements, their subspherical shape, and their having been embedded in local bedrock demonstrate that they are naturally formed, calcite-cemented cannonball concretions, which have been described from Egypt, Kansas, New Zealand, and the southwestern United States (3–6).

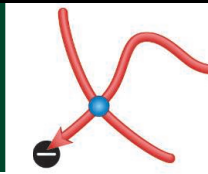
However, no matter how obviously natural the various features that comprise pseudoarchaeological sites are to conventional geologists and archaeologists, dismissing them as "pseudoscience" is not enough. Instead, we need to explain to the public—using empirical data and logical arguments published in either popular articles, field guidebooks, Web pages, or other media—how natural features are either being misidentified or misrepresented as cultural





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artifacts. The wide interest generated by Bosnian “pyramids,” the “Phoenician Furnace and Fortress” of Oklahoma, and other pseudoarchaeological sites offers an opportunity to educate a curious public about the origin and significance of the geologic features such as systematic jointing, Leisegang banding, ripple marks, sole marks, and concretions that comprise them.

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Effect of Poor Census Data on Population Maps

THE REVIEW “LARGE-SCALE SPATIAL-TRANSMISSION models of infectious disease” (S. Riley, 1 June, p. 1298) states that “[f]or humans, an accurate estimate of population density is available for the entire Earth, up to a resolution of 1 arc sec.” The differing modeling approaches and input data used in the many global human population surfaces (1–3) mean that the estimated spatial distribution of populations and consistency both within and between products varies markedly.

The spatial resolution of input census data is critical to the mapping accuracy (4). For many countries, contemporary census data collected at a high administrative unit level exist to facilitate “accurate,” realistic-looking population mapping (e.g., fig. S1A) (5). For the majority of low-income countries, however, such data do not exist. This is especially true for much of Africa, where census data used for the production of global products are often over a decade old and at a resolution just below national level; a simple glance at the blocky and unrealistic-looking population distributions mapped for many African countries suggests that accuracy

varies substantially (e.g., fig. S1B).

The lack of high-resolution data across much of the low-income regions of the world is likely to represent a significant limit to extending the reliable application of large-scale spatial transmission models of infectious diseases.

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Response

TATEM RAISES A POTENTIALLY IMPORTANT ISSUE. The accuracy of estimates of population density varies according to the quality of available supporting census data. However, current estimates for areas with poor census data may be sufficiently accurate to be used by studies based on large-scale spatial-transmission models.

Consider the potential transmission dynamics of reemergent smallpox. The main hypothesis supported in (1) is that, for the United Kingdom, spatial disc vaccination around known cases at either 15 or 50 km would not be an efficient addition to contact tracing, isolation, and vaccination. For the Central African Republic (CAR), results from a similar study would depend on the underlying assumptions of the human population model. Specifically, visual comparison of output from the global population model (2) for the CAR and northern Democratic Republic of Congo (immediately south of the CAR) suggests that heterogeneity between major roads in the CAR is underestimated. The sensitivity of predictions of disc vaccination efficacy for the CAR would have to be tested against this frailty, just as they would have to be tested against other key assumptions such as travel behavior and pathogen transmissibility. The post-hoc adjustment of global population data required for these sensitivity analyses would present particular technical

challenges. However, given the much lower population densities in the CAR compared with the United Kingdom, if accurate travel data were available, it is entirely possible that a large-scale spatial-transmission model could be used with current global human population estimates to generate robust evidence in support of disc vaccination, perhaps with disc sizes greater than 50 km.

Another example where current population density estimates for Africa may be useful is in the analysis of the effects of sexual behavior change on the incidence of HIV in Uganda and Zimbabwe at different times (3). Did behavior changes affect the evolution of the regional incidence pattern over time, or is HIV incidence locally self-sustaining? If similar sustained behavior changes occur in other countries, can we predict spatial patterns of endemicity and/or eventual eradication of sexually transmitted infections? How useful could spatial targeting of resources across the region be in minimizing overall incidence? I do not suggest for a moment that large-scale spatial-transmission models can provide rapid definitive answers to these broad questions. However, using current population density estimates to construct large-scale models with these questions in mind might be a good starting point from which more specific relevant hypotheses could be generated.

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4. I thank G. Garnett for commenting on this response and The Research Fund for the Control of Infectious Diseases of the Government of the Hong Kong Special Administrative Region for funding.

Light-Splitting Method Not New

THE NEWS OF THE WEEK ARTICLE “LIGHT-splitting trick squeezes more electricity out of Sun’s rays” (E. Kintisch, 3 August, p. 583) conveys the erroneous impression that a spectral splitting solar concentrator using a dichroic mirror is a novel, unproven method to achieve high efficiency. Although the group at the University of Delaware deserves commendation for setting an efficiency record, the approach is not new. In 1978, a group at Varian, working under a U.S. Department of Energy/Sandia contract, demonstrated an identical system using sili-

con and AlGaAs cells (1). The 28.5% module efficiency set a record at the time, which has been surpassed with the advent of stacked multijunction cells. Today, textbooks on photovoltaics describe such systems (2).

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Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the previous 3 months or issues of general interest. They can be submitted through the Web (www.submit2science.org) or by regular mail (1200 New York Ave., NW, Washington, DC 20005, USA). Letters are not acknowledged upon receipt, nor are authors generally consulted before publication. Whether published in full or in part, letters are subject to editing for clarity and space.

CORRECTIONS AND CLARIFICATIONS

Reports: "Intra- and intermolecular band dispersion in an organic crystal" by G. Koller *et al.* (20 July, p. 351). The legend for Fig. 1 should have included the following information: The illustrative STM image of Fig. 1B was obtained at the Institute of Physics, Freie Universität Berlin, in collaboration with L. Grill.

Reports: "Food web-specific biomagnification of persistent organic pollutants" by B. C. Kelly *et al.* (13 July, p. 236). In Table 1, molecular weights were incorrectly reported for six chemicals. The corrected molecular weights (in parentheses) for the following compounds are: trifluralin (335); 1,2,4,5 TeCBz (216); PCB 180 (395); PBDE 47 (486); PBDE 99 (565); and PBDE 209 (960).

TECHNICAL COMMENT ABSTRACTS

Comment on "Top-Down Versus Bottom-Up Control of Attention in the Prefrontal and Posterior Parietal Cortices"

Jeffrey D. Schall, Martin Paré, Geoff F. Woodman

Buschman and Miller (Reports, 30 March 2007, p. 1860) described the activity of ensembles of neurons in parietal and frontal cortex of monkeys performing visual search for targets that were easy or hard to distinguish from distractors. However, their conclusions are called into question by discrepancies between their results and publications from other laboratories measuring the same neural process.

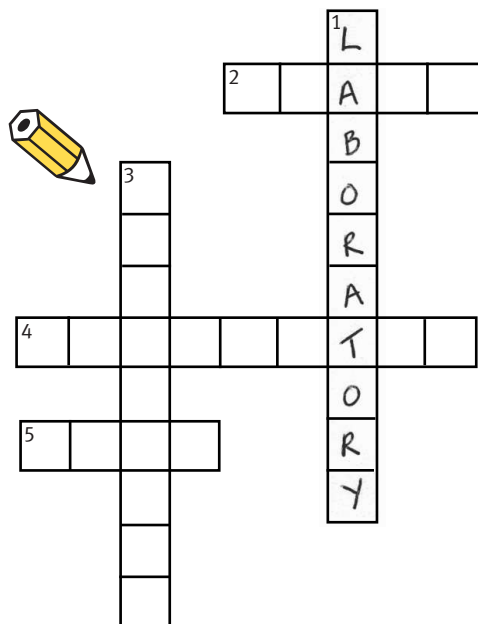
Full text at www.sciencemag.org/cgi/content/full/318/5847/44b

Response to Comment on "Top-Down Versus Bottom-Up Control of Attention in the Prefrontal and Posterior Parietal Cortices"

Earl K. Miller and Timothy J. Buschman

We reported latencies for target selection based on the earliest neurons to show effects, which Schall *et al.* mistakenly compare to latencies based on population averages. We show that there are actually no discrepancies across studies and also discuss the relative merits of single-electrode versus multiple-electrode approaches.

Full text at www.sciencemag.org/cgi/content/full/318/5847/44c



Across:

2. To impart knowledge
4. The science of matter
5. A method for trying or assessing

Down:

1. Place equipped to conduct scientific experiments
3. Variety; multiformity

1. laboratory; 2. teach; 3. diversity; 4. chemistry; 5. test

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