



LETTERS

edited by Jennifer Sills

Springtime for Science in Egypt



AS A PROFESSOR OF HUMAN GENETICS AT A RESEARCH INSTITUTE in Egypt, I read with great interest the News & Analysis story “Post-Mubarak era seen as opening for science” (A. Lawler, 25 February, p. 996). I share the optimism that my Egyptian research colleagues expressed in the story, but to ensure that a new attitude toward science takes hold, we must consider several crucial points.

First, advances in scientific research must be supported by political will. The new government should make scientific research a national priority. Second, the Egyptian youths’ demand for freedom in Egypt must also be applied to scientific research; researchers must have the freedom to access knowledge and participate in international collaborations and exchanges. The direction of research should not be governed by state security but should be directed only by a national research strategy determined by local needs and modern fields of research. Third, I agree with Ali Douraghy that the bureaucracy needs to

be streamlined, but political will and transparent measures will gradually solve this problem. Simplifying the processes for obtaining necessary equipment and creating a cooperative environment between research centers are essential steps toward improving research. Fourth, we must improve the working conditions and financial compensation for researchers.

Researchers in Egypt and abroad must work together to ensure an environment of freedom, transparency, and social interaction in the new modern Egypt.

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CT Risks Dwarfed
by Diagnostic Benefits

THE NEWS FOCUS STORY “SECOND THOUGHTS about CT imaging” (L. Schenkman, 25 February, p. 1002) describes the theoretical risk of low-dose radiation from computed tomography (CT), the growing use of CT in medical practice, and its use (and presumed overuse) in the diagnosis of appendicitis, especially in children. The story suggests that without CT, appendicitis can be “diagnosed easily by ultrasound or even observation.” This reflects a common misconception. Hands-on familiarity with the clinical prob-

lem will quickly dispel this notion and validate the use of CT.

In the era before widespread use of CT, diagnosis almost exclusively relied on clinical criteria and observation. These methods consistently yield a negative appendectomy rate (normal appendix found at surgery) of at least 15% (1, 2). Given more than 250,000 appendectomies in the United States per year, this in turn translates into tens of thousands of unnecessary surgeries per year—most done in otherwise healthy individuals, often children. In contrast, CT evaluation can help drive down the negative appendectomy rate to as low as 2% (2, 3). One must contrast this

very large and well-established cost of not imaging (in morbidity and dollars) with the small and theoretical future risk from CT-associated radiation exposure.

Ultrasound is a valuable tool in the diagnosis of appendicitis, but it cannot replace CT. At least 5% of ultrasounds interpreted as positive are false positives (4, 5), and more than one-third are interpreted as equivocal (5). If accuracy is defined as the ability to correctly diagnose the presence or absence of appendicitis, the accuracy of ultrasound is a discouraging 60% (5). In addition, the ease and safety of ultrasound make it more likely to be used in cases of lower clinical suspicion. This generates a Bayesian nightmare. In this low-incidence population, even a modest false-positive rate will lead to a large number of negative appendectomies. Furthermore, the many equivocal ultrasound scans will prompt many follow-up CT scans for definitive diagnosis. Thus, perversely, aggressive use of ultrasound may increase the number of CT scans performed, specifically in patients without significant pathology.

Sensitive to the radiation concerns, we continue to explore alternative approaches, such as enhanced-ultrasound and magnetic resonance imaging (MRI). Not surprisingly, these strategies have their own issues. For example, MRI is not as readily available, and the longer acquisition time requires sedation in younger children. Until we have accurate, well-vetted

Letters to the Editor

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Culture:
Loose or tight?

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SPORE Prize
Essay

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alternatives, it would be an astounding failure of mission and an unconscionable abdication of responsibility to our patients to eschew CT and allow the current radiation scare to return us to the dismal days of uncertain diagnoses, error, and patient misfortune.

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Value of Small Forest Fragments to Amphibians

MANY IN THE BRAZILIAN SCIENTIFIC COMMUNITY are concerned about the Forest Act revision, the proposed environmental legislation affecting private lands (1, 2). The revision would benefit sectors that hope to expand agricultural frontiers by clear-cutting forests



and savannas. The vote on the law (#1876/99) was put on hold in late 2010 for the presidential elections. It is scheduled to resume in the coming week. We would like to emphasize that, although conservationists typically lobby for protection of large areas of contiguous forests to support biodiversity, even forest fragments have value. Clear-cutting existing forest fragments, which will result if the Forest Act revision is passed, will have serious ramifications for some species, particularly amphibians.

Studies have demonstrated that the presence of small forest fragments of Semidecid-

ual Atlantic Forest (70 to 100 ha) significantly enhances the diversity of amphibians (3, 4). Small forest cover provides amphibians with habitat refuge and dispersal corridors. These limited habitats may also be important for maintaining hydrologic regimes and water quality that are critical for many amphibians' existence. The reduction in forest area remnants can promote the "habitat split" phenomenon (5), recognized as a major threat to anuran (frogs with aquatic larvae). This process occurs when the environments that anurans use for foraging and reproduction are disconnected, resulting in a more hostile environment during migration and dispersion. In inland São Paulo state, the expansion

of sugarcane crops to produce ethanol has led to the elimination of small forest areas and ponds outside woodlands, threatening the anurans that use the ponds as breeding sites. We join the chorus of the scientific community and nongovernmental environmental organizations in urging Brazil's congressmen to reconsider this revision of the environmental legislation, in view of the damage that it could bring to Brazilian biodiversity.

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CORRECTIONS AND CLARIFICATIONS

News & Analysis: "Winds of change leave bioscientists scrambling" by D. Normile (8 April, p. 165). Stephanie Wehner, of the Centre for Quantum Technologies at National University of Singapore, completed her postdoc at California Institute of Technology in Pasadena, not Stanford University. Also, the Agency for Science, Technology, and Research is a statutory board under Singapore's Ministry of Trade and Industry, not a department of the Economic Development Board.

Reports: "Early Pleistocene presence of Acheulian hominins in South India" by S. Pappu *et al.* (25 March, p. 1596). Author affiliation 3 was incorrect in the manuscript. It should read "Centre Européen de Recherche et d'Enseignement de Géosciences de l'Environnement, CEREGE, CNRS and Université Paul Cézanne, BP 80 Europôle Méditerranéen de l'ARBOIS, 13545 Aix en Provence cedex 04, France." Additionally, the following information was omitted from the acknowledgments: "We thank N. Durand, D. Bourlès, the Université Paul Cézanne Aix Marseille, and CNRS for assistance." The ASTER national facility (CEREGE, Aix-en-Provence) is supported by the Université Paul Cézanne Aix-Marseille III.

TECHNICAL COMMENT ABSTRACTS

Comment on "A Persistent Oxygen Anomaly Reveals the Fate of Spilled Methane in the Deep Gulf of Mexico"

Samantha B. Joye, Ira Leifer, Ian R. MacDonald, Jeffery P. Chanton, Christof D. Meile, Andreas P. Teske, Joel E. Kostka, Ludmila Chistoserdova, Richard Coffin, David Hollander, Miriam Kastner, Joseph P. Montoya, Gregor Rehder, Evan Solomon, Tina Treude, Tracy A. Villareal

Kessler *et al.* (Reports, 21 January 2011, p. 312) reported that methane released from the 2010 Deepwater Horizon blowout, approximately 40% of the total hydrocarbon discharge, was consumed quantitatively by methanotrophic bacteria in Gulf of Mexico deepwaters over a 4-month period. We find the evidence explicitly linking observed oxygen anomalies to methane consumption ambiguous and extension of these observations to hydrate-derived methane climate forcing premature.

Full text at www.sciencemag.org/cgi/content/full/332/6033/1033-c

Response to Comment on "A Persistent Oxygen Anomaly Reveals the Fate of Spilled Methane in the Deep Gulf of Mexico"

John D. Kessler, David L. Valentine, Molly C. Redmond, Mengran Du

We hypothesized that methane from the Deepwater Horizon oil spill was quantitatively consumed and presented results from four tests supporting this finding. Subsequent published studies provide further support for our conclusions. We refute the criticisms by Joye *et al.*, which are incorrect, internally contradictory, based on flow-rate estimates that exceed consensus values, and overall do not disprove our hypothesis or invalidate its underlying assumptions.

Full text at www.sciencemag.org/cgi/content/full/332/6033/1033-d

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