

Retraction

IN THE REPORT "SYNAPTIC CHANGES IN LAYER 2/3 underlying map plasticity of developing barrel cortex" (*I*), we concluded that functional and anatomical changes in layer 2/3 underlie different forms of cortical map plasticity. It was pointed out to us by a reader that the anatomical analysis contains errors. Although these errors did not affect the main conclusions, we re-analyzed the data set. Re-analysis confirmed that whisker stimulation evokes a cortical response, which spreads preferentially to neighboring, nondeprived cortical columns as originally reported. However, the reported difference between the axonal fields in control and deprived animals was not statistically significant. Further, the deprivation-induced decrease in unitary EPSP amplitude was also not statistically significant. Thus, major conclusions of the Report are no longer supported, and we retract the Report. We apologize for any confusion that we may have caused to the readers of *Science*.

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1. C. C. H. Petersen, M. Brecht, T. T. G. Hahn, B. Sakmann, *Science* **304**, 739 (2004).

GALEX and UV Observations

IN HIS ARTICLE "ULTRAVIOLET ASTRONOMERS face loss of vision" (News Focus, 25 June, p. 1899), Govert Schilling makes the important point that we will soon lose our view of the ultraviolet (UV) sky unless we preserve or replace the few existing UV space missions. However, for the Galaxy Evolution Explorer (GALEX), the future now looks brighter than the fall 2005 end date stated in the article. GALEX received the top ranking in the April 2004 Senior Review of Astronomy and Physics Mission Operations and Data Analysis

Programs (*I*). NASA accepted the recommendation for "completion of the prime mission in FY05 and FY06, with an extended mission covering... FY07-FY08" [*I*, p. 4]. GALEX is healthy and carries no consumables, so we hope it will be capable of observing well beyond 2008.

Schilling's article discusses the importance of UV observations. Emphasizing this, the NASA Review lists three areas in which GALEX surveys are particularly significant to the astrophysics community. The first is synergy with FUSE and HST, UV missions that can follow up on sources identified by GALEX. Second, the wide-area GALEX legacy database of the 135- to 280-nm UV sky promises to be "one of the most important data sets in astrophysics in this decade" [*I*, p. 4]. Third, the GALEX Guest Investigator (GI) program will broaden GALEX scientific impact well beyond the primary science of star formation history in galaxies.

Finally, we wish to qualify Schilling's caveat about the dearth of glorious UV



The GALEX observation of M31 is a mosaic of 10 GALEX images with FUV and NUV displayed in blue and red, respectively. The image shows blue regions of young, hot, high-mass stars tracing out the spiral arms where star formation is occurring and the central orange-white "bulge" of old, cooler stars formed long ago. The star-forming arms of M31 are unusual in being quite circular rather than the usual spiral shape. Many other regions of star formation can be seen far outside the main body of the galaxy. The image shows several smaller companion galaxies. These include M32, a dwarf elliptical galaxy directly below the M31 central bulge and just outside the spiral arms, and M110, which is above and to the right of the M31 center. M110 has an unusual FUV bright core in an otherwise "red" old star halo.

Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the previous 6 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.

images. The wealth of GALEX images are both beautiful and scientifically compelling (2). The GALEX images trace star formation in a profound variety of physical settings, as well as many otherwise invisible physical processes important in understanding galaxy formation and evolution in the local and early universe.

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References

1. See <http://spacescience.nasa.gov/admin/divisions/sz/SenRev04.pdf>.
2. See samples at www.galex.caltech.edu/imagegallery.html.

Clinical Trials or Exploitation?

THE CHANGING LANDSCAPE OF RESEARCH and the market pressures are causing a shift of medical experiments by U.S. entities overseas, where bureaucracy is less rigorous, patients are more eager to enroll, and costs are significantly lower. Ethical concerns about international trials and the protection of subjects have been heightened (1, 2). Nonetheless, little has been done to prevent underprivileged communities from being left out of clinical and scientific benefits after having served as test subjects. This happens in 33% of the studies conducted overseas (3); after a successful trial, the sponsor does not market the product locally. In the United States, patients tested for a new product continue to receive it either through the market or by applying to special programs. Sponsors should be required to market the new drug in the country where the trial was carried out, and to do so considering local economy, health care coverage, and purchasing power. This calls for a more direct involvement of local institutions. This would allow such institutions to not only protect individual patient rights, but also gain expertise and become more competitive.

We understand the economic and practical barriers faced by U.S. sponsors, as much as we acknowledge their need to maintain profits. Nonetheless, we see an urgent need for international consensus on ethical guidelines for entities conducting clinical experiments overseas. Such guidelines must cover all phases of a trial, from the design to the follow-up, through the review process, but they cannot be mere recommendations, as seen so far. Compliance with these rules must become a prior binding condition for the approval of any study proposal. This would constitute an important step taken against scientific capitalism, ethical relativism, and, in general, toward a fairer world.

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References and Notes

1. The National Bioethics Advisory Commission (NBAC), *Ethical and Policy Issues in International Research* (NBAC, Bethesda, MD, 2001).
2. World Medical Association (WMA), "Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects," adopted in June 1964; last note of clarification in 2002.
3. P. Lurie, S. M. Wolfe, Letter to the National Bioethics Advisory Commission regarding their report on the challenges of conducting research in developing countries (Public Citizen Health Research Group Publication No. 1545), 13 Nov. 2000 (available at www.citizen.org/publications/release.cfm?ID=6746).

Climate Change and Malaria

SIR DAVID A. KING'S CLAIM THAT "CLIMATE change is the most severe problem that we are facing today—more serious even than the threat of terrorism" ("Climate change science: adapt, mitigate, or ignore?," Policy Forum, 9 Jan., p. 176) is based, in part, on UK government-sponsored impacts analyses (1, 2) that estimate that by the 2080s, because "of continued warming, millions more people around the world may in future be exposed to the risk of hunger, drought, flooding, and debilitating diseases such as malaria. Poor people in developing countries are likely to be most vulnerable" (p. 176). But the very studies underlying the latter quote, and which King cites, show that, for the most part, many more millions would be at risk in the absence of climate change (2). For instance, the population at risk of malaria (PAR-M) in the absence of climate change is projected to double between 1990 and the 2080s, to 8,820 million (2). However, unmitigated climate change would, by the 2080s, further increase PAR-M by another 257 to 323 million (2).

Thus, by the 2080s, halting further climate change would, at best, reduce total PAR-M by 3.5% [=100 × 323/(323 + 8,820)] (3). On the other hand, reducing carbon dioxide emissions with the goal of eventually stabilizing carbon dioxide at 550 ppm would reduce total PAR-M by 2.8% (2) at a cost to developed nations, according to King, of 1% of GDP in 2050 (p. 177), or about \$280 billion in today's terms (4). But malaria's current annual death toll of about 1 million could be halved at an annual cost of \$1.25 billion or less, according to the World Health Organization, through a combination of measures such as residual home spraying with insecticides, insecticide-treated bednets, improved case management, and more comprehensive antenatal care (5). Clearly, implementing such measures now would provide greater malaria benefits over the next few decades than would climate stabilization at any level. It would also reduce vulnerability to malaria from all causes—man-made or natural—now and in the future (3). Similarly, reducing present-day vulnerabilities to the other risk factors mentioned by King (i.e., hunger, water shortage, and flooding) could well provide larger benefits at lower costs over

A Bit of History About Edwin A. Link

I WAS INTERESTED TO READ THE NEWS FOCUS

discussion regarding the fiscal and educational challenges being undertaken by many U.S. marine laboratories, including the Scripps Institution of Oceanography (SIO), Harbor Branch Oceanographic Institution (HBOI) and Woods Hole Oceanographic Institution (WHOI) ("Saving Scripps," D. Malakoff, 9 July, p. 166). It is important that the contributions of the pioneering engineers and scientists who helped found these institutions not be overlooked, though.

For example, the photo caption accompanying the sidebar on p. 167 notes that the Harbor Branch submersibles were named after Seward Johnson Sr., but neglects to mention that they were also named after the late Edwin A. Link (1904–81), the engineer and inventor who designed the Johnson-Sea-Link (JSL) submersibles, as well as many other novel marine engineering devices (e.g., the submersible decompression chamber and the first pressurized diver lockout small submersible). Link and Johnson worked hand in hand from their respective engineering and financial backgrounds during the founding and initial operation of HBOI, and the name of the submersibles reflects the importance of their dual contributions.

The Link Foundation, established by Ed Link and his wife, Marion, continues to provide vital financial support to Harbor Branch, including sponsorship of their Summer Internship program, which this year celebrates its 30th year of launching the careers of future marine scientists and ocean engineers.

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CORRECTIONS AND CLARIFICATIONS

News Focus: "Telescopes break new ground in quest for cosmic rays" by D. Clery (3 Sept., p. 1393). The location given for the Whipple telescope was incorrect. The Fred Lawrence Whipple Observatory is on Mount Hopkins, Arizona, not Kitt Peak.

Reports: "Foundering lithosphere imaged beneath the southern Sierra Nevada, California, USA," by O. S. Boyd *et al.* (30 July, p. 660). There were errors in temperatures reported in the Fig. 3 caption. The correct sentence is "Compositions defined in the text that best match the seismic observations are garnet pyroxenite (red diamond) at 1000°C, spinel peridotite (red circle) at 1200°C, and garnet peridotite (red triangle) at 1000°C." Also, the source of the fellowship listed in the acknowledgments in reference 30 was incorrect. It should have been the Cooperative Institute for Research in Environmental Sciences.

the next few decades than would climate change mitigation efforts that go beyond so-called "no-regret" actions, that is, actions that are worth undertaking on their own merits unrelated to any climate change-related concerns (e.g., elimination of subsidies for fossil fuel usage or land clearance) (3).

The World Bank estimates that with additional annual expenditures of \$40 to \$60 billion, the United Nation's Millennium Development Goals to advance sustainable development could be reached by 2015 (6, 7). Comparing these goals (e.g., at least halving poverty, hunger, illiteracy, child and maternal mortality, and the proportions of populations lacking safe water and sanitation) (6) against what can be expected from halting further climate change (2) indicates that no matter how serious climate change is compared to terrorism, it pales by comparison with the more mundane problems poor people in developing countries face today and over the next few decades. Even advancing halfway toward those goals would provide greater benefits for environmental and human well-being from now through the 2080s, and do so more economically than would heroic mitigation efforts (2, 6). Thus, it would be far more beneficial, and cost-effective, at least for the next several decades, to reduce vulnerabilities to current problems, especially if they might be exacerbated by climate change (e.g., hunger, malaria, drought, and flooding) (3). Even with a lagtime of 50 years to account for the inertia of the climate and energy system, the aforementioned analyses suggest we may have at least a quarter century window (2080s minus 50 years) before deciding on the depth and extent of mitigation. Meanwhile, we should focus on improving mitigation and adaptation technologies and our knowledge of climate change science, economics, and responses. This way we can advance sustainable development and solve the problems of today while furthering our ability to solve the problems of the day after tomorrow.

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*Views expressed here are the author's and not necessarily those of any unit of the federal government.

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2. N. W. Arnell *et al.*, *Clim. Change* **53**, 413 (2002).
3. I. M. Goklany, *Energy Environ.* **14**, 797 (2003).
4. World Bank, *World Development Indicators* (World Bank, Washington, DC, 2004).
5. World Health Organization, *World Health Report 1999* (WHO, Geneva, 1999).

6. World Bank, "The Costs of Attaining the Millennium Development Goals," available at www.worldbank.org/html/extdr/mdgassessment.pdf (accessed 25 June 2004).
7. United Nations, "UN Millennium Development Goals," available at www.un.org/millenniumgoals/ (accessed 8 July 2004).

Response

THERE IS NO REAL CHOICE BETWEEN ACTION ON climate change and action on poverty, disease, hunger, and other millennium development goals. These are part of the same sustainable development agenda. Climate change is already affecting developing countries, and it is the poorest regions of the world—such as Africa and Southeast Asia—that are most at risk. The many people who have died and the millions now homeless through the monsoon flooding in Bangladesh will bear witness to that. This kind of event can be expected to become more frequent and more extreme as global warming accelerates, exacerbated by rising sea levels.

To meet the millennium development goals, serious investment is needed in areas such as public health and infrastructure for water and energy. The British government under Prime Minister Tony Blair's leadership is strongly committed to that. The total UK official development assistance (ODA) will rise to almost £6.5 billion by 2007/08, which will mean that our ODA will have risen from 0.26% of Gross National Income (GNI) in 1997 to 0.47% in 2007/08.

At the same time, the clock is ticking as concentrations of greenhouse gases mount in the atmosphere. At well over 370 ppm, we are already at 50% above preindustrial levels, unlikely to have been seen on Earth for around 20 million years. Global action is needed now if we are to retain the chance to stabilize emissions at a level to avoid even more dangerous climate change than that to which we are already committed. The work of the Intergovernmental Panel on Climate Change, representing the overwhelming majority of world scientific opinion, including in the United States, has shown that we are now on track to seeing average global temperatures rise by 1.5° to 5.8°C this century as a result of human activities—burning of fossil fuels and deforestation. Failure to act will result in a price, both human and economic, that will be paid across the world for generations to come. Once CO₂ is released into the atmosphere, it will remain there for centuries.

That is why real climate action is needed now at a global level. As Tony Blair has announced, during our G8 Presidency, we wish to deliver real progress on both climate change and African development.

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