

Dark lenses

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Wood energy

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LETTERS

edited by Jennifer Sills

A National Initiative for Social Participation

THE TRANSFORMATIVE POWER OF THE INTERNET IS MORE THAN ACCESS TO INFORMATION; it is increasingly about contributing, collaborating, and participating. Metaphors based on information highways are giving way to community visions that capture the remarkable enthusiasm for user-generated content and social media. At the same time, President Obama is calling for civic service and personal responsibility to rebuild America. Combining these ideas could promote the shift from playful, discretionary Internet usage to larger, more serious projects aligned with national priorities such as health care, community safety, education, and innovation.

The good news is that there are many promising social action networks, but these nascent explorations could be greatly accelerated by an organized research program. This program would systematically study the emerging phenomena, determine the sources of success or failure, and disseminate best practices. The payoffs are large enough to warrant an intense national effort akin to NASA's space program or the National Institutes of Health.

Health discussion groups have long been one of the Internet's success stories. Now, clever entrepreneurs are exploring new social participation ideas with projects such as the www.PatientsLikeMe.com Web site, where users offer their medical experiences in the hope of learning about treatment outcomes from one another. At the same time, these users are building a remarkable resource for medical research and discovery. Physicians have already discussed 30,000 cases at www.sermo.com, where they can offer insights about innovative treatments as well as detect unusual disease patterns. Large corporations also recognize the opportunities and are inviting users to store their medical histories in the Microsoft Health Vault or at Google Health.

Although social networking plays only a small role in national security, community safety could be enormously improved by expanding resident reporting systems, such as www.WatchJeffersonCounty.net, which collects reports of unusual behaviors. These reports provide important clues for civic officials to prevent crimes, control teenage gangs, or simply fix potholes. A huge success, now run by the U.S. Department of Justice, is the Amber Alert reporting system for abducted children. Beyond the 430 cases they claim to have helped solve, the awareness generated among 7 million participants may have prevented many more abductions. Web sites for reporting extreme weather effects, such as Storm Watchers typically run by local radio and television stations, are being joined by reporting schemes for earthquake damage, influenza outbreaks, food poisoning, and other community problems. The micro-blogging tool Twitter is now rapidly spreading, as users from Orange County firefighters to Mumbai police post their 140-character messages about where they are and what they are doing.

Reading Wikipedia articles is now a common tactic for learners of all ages, but the stronger boost to education comes when students start writing Wikipedia articles. They become engaged in the social process of com-

menting on each other's work, arguing over quality criteria, and discussing what needs to be added. E. O. Wilson's dream of the Encyclopedia of Life, with a Web page for each of Earth's 1.8 million species, is on its way to becoming a citizen science success story that raises environmental awareness. Even YouTube, whose success was spiked by playful videos, is becoming the go-to educational resource and the place for students to post their term projects. These and many other initiatives are based on the collect-relate-create-donate mantra that suggests education happens when students start by collecting information, then move on to working in teams to create ambitious projects for the benefit of someone outside their classroom.

Innovation itself is getting turbocharged by going social. Open-source software projects are now taken seriously by big companies who claim greater reliability for programs that have been tested and read by millions of eyes. Open innovation is gaining similar credibility as corporate research directors who post their problems on www.Innocentive.com get hundreds of

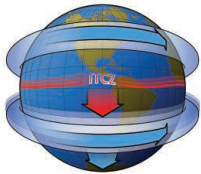
serious solutions from diverse creative types. Bloggers are influencing every profession as these self-appointed information gatekeepers post hourly updates about what's new, thereby stimulating rapid progress on emerging problems and getting a jump on the news media.

The benefits of social media participation are well understood by Obama's staff—during the campaign, they engaged 4 million donors and volunteers. To replicate their success, a National Initiative for Social Participation could stimulate effective collaborations in many professions, restore community social capital, and coordinate national service projects. The challenge is to understand what motivates participants, such as altruism, reputation, or community service. Researchers would have to develop fresh strategies that increased the conversion rates from readers to contributors from the currently typical 100 to 1 to much higher rates. Getting contributors to collaborate for ambitious efforts and to become leaders or mentors are further challenges. Coping



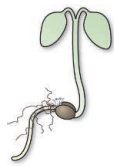
Letters to the Editor

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.



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with legitimate dangers such as privacy violations, misguided rumors, malicious vandalism, and infrastructure destruction or overload all demand careful planning and testing of potential solutions.

The huge research effort required for a National Initiative for Social Participation would tap the skills of computer scientists to build scalable and reliable systems, interface designers to accommodate diverse user needs, and social scientists to study successes and failures. The risks are substantial, but the pay-offs could be enormous. **BEN SHNEIDERMAN**

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Note

1. To participate in this initiative, join the Facebook group named iparticipate.

Indian Neutrino Detector: The Elephant in the Room

THE VERY SERIOUS ENVIRONMENTAL IMPLICATIONS of establishing the India-based Neutrino Observatory (INO) in Singara within the Nilgiri Biosphere Reserve and in the buffer zone of the Mudumalai Tiger Reserve (“Indian neutrino detector hits snag on environmental concerns,” P. Bagla, News of the Week, 9 January, p. 197) must be recognized if India is to save its most viable Asian elephant population from extinction. This population has declined so precipitously over the past three decades due to poaching and habitat loss that it is on the verge of collapse (1). Fully mature Tuskers (bulls) have become

very rare in this range. The study of the smallest particles on Earth, neutrinos, should not justify driving the last viable Asian elephant herd and tiger population in India into extinction. **MICHAEL W. FOX**

Global Communications for Conservation Inc., New York, NY 10155, USA. E-mail: ipan@erols.com

Reference

1. R. Bandara, *South Asia Econ. J.* 5, 283 (2004).

Indian Neutrino Detector: Environmental Costs

I WOULD LIKE TO SPELL OUT THE ENVIRONMENTAL costs of building the India-based Neutrino Observatory (INO) discussed in the News of the Week story “Indian neutrino detector hits snag on environmental concerns” (P. Bagla, 9 January, p. 197). The first foreseeable impact would be a sizable increase in the human population, furthering habitat destruction. Transporting the estimated 630,000 tons of debris and 147,000 tons of construction material would require about 156,000 truck trips through a vital protected area. INO would require 320,000 liters of water per day, further

draining a drought-prone region. The Environmental Impact Assessment (*I*) upon which this project was approved was not based on scientific data and is widely acknowledged as being seriously flawed (2).

The international scientific community should be aware that the INO project is not site specific—in theory, a neutrino observatory can be located in any underground site with sufficient rock cover. There was no attempt to find suitable sites in less critical areas. The INO team limited its search to only two sites: Rammam in Darjeeling and Singara in the Nilgiri Biosphere Reserve. Because Rammam is in an area of higher seismic activity, the team selected Singara.

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References

1. P. A. Azeez, S. Bhupathy, P. Balasubramanian, R. Chandra, P. P. Nikhilraj, "India-based Neutrino Observatory—Rapid EIA" (SACON report, 2007).
2. A. Desai, P. Davidar, J.-P. Puyravaud, G. Srinivasan, N. Mohanraj, T. Thekaekara, "Environmental concerns around the proposed site for the India-based Neutrino Observatory" (NBR Alliance report, 2008); www.nbralliance.org/downloads/environmental-concerns-around-ino-site.pdf.

Response

THE PROPOSED INDIA-BASED NEUTRINO Observatory (INO) (*I*) would be located in Singara, which is 7 to 15 km from the boundary of the Mudumalai Wildlife Sanctuary in the Nilgiri Biosphere Reserve. The INO collaboration is fully committed to protecting the environment and wildlife and will take all possible steps to minimize the impact during the construction of the underground laboratory. During the operation phase, it is expected to have no impact at all.

Regarding population growth, the laboratory will be located deep underground and accessed by a tunnel 2 km in length. Researchers will be located at the main INO research and development center in the city of Mysore, about 100 km away. Except during the construction phase, the number of scientists and engineers manning the laboratory will be kept at a bare minimum (at most 30 people). The present population of Masinagudi village area, in which the project will be housed, is 12,535. INO will not significantly increase this population.

The initial site survey was conducted over a period of 5 years with the assistance of geol-

ogists and engineers. The two sites mentioned by Davidar were selected for more serious study. The Singara site was chosen over Rammam on the basis of a geotechnical analysis that considered physics requirements, safety, and long-term stability of the laboratory. About 13 km of tunnels have been constructed over the past decade in the vicinity of the proposed INO site to locate a large underground hydroelectric power station whose access portal is within a few hundred meters of the proposed INO tunnel portal. Due to the proximity of this hydroelectric power station, we do not have to build any new roads, thereby causing minimum damage to the environment.

Regarding transport of material, about 608,000 tons of debris (mainly granite) will be excavated. However, this debris will be stored onsite for a long time. About 35,000 tons of construction material and 51,000 tons of detector material (86,000 tons in all) will be brought into the site over a period of 7 years. The heavy-vehicle traffic required to do so will be no more than six round trips per day over a period of 7 years, which is negligible compared with the existing

traffic. The major concern with the transportation of this material is that the access road to the INO site cuts through an elephant corridor. To address this, we plan to restrict the traffic to six round trips a day during daylight hours.

The water requirement is 342,000 liters of water per day, which is 0.2% of the availability at the Singara diversion weir (68,086 million liters of water available per annum). The INO project has been engaged in talks with the local people to clarify these issues, and the local village administration has passed a resolution welcoming the INO project.

The INO project is a pure science laboratory and not an industry. We believe that it is possible to build and run the underground laboratory to explore the working of nature without damaging it. INO is both an opportunity and a challenge to be a model project that combines pure science research with sensitivity to its local ecology and environment.

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Reference

1. India-based Neutrino Observatory (www.imsc.res.in/~ino).

CORRECTIONS AND CLARIFICATIONS

Reviews: "The psychology of transcending the present" by N. Liberman and Y. Trope (21 November 2008, p. 1201). On page 1203, the legend to Fig. 3 should read as follows: "Items from the Street Gestalt Completion Test (courtesy of Teachers College, Columbia University)." The text referring to the figure should be changed to "the Gestalt Completion Test (Fig. 3), see also (11)."

Reviews: "Oxytocin, vasopressin, and the neurogenetics of sociality" by Z. R. Donaldson and L. J. Young (7 November 2008, p. 900). The peptide sequence anepressin should have been referred to as annetocin to be consistent with previous literature.

TECHNICAL COMMENT ABSTRACTS

COMMENT ON "Detection, Stimulation, and Inhibition of Neuronal Signals with High-Density Nanowire Transistor Arrays"

Peter Fromherz and Moritz Voelker

Patolsky *et al.* (Reports, 25 August 2006, p. 1100) used silicon nanowires to record action potentials in rat neuronal axons and found increases in conductance of about 85 nanosiemens. We point out that the data correspond to voltage changes of about -85 millivolts on the nanowire and that conceivable mechanisms of axon-nanowire interaction lead to signals that are opposite in sign or smaller by orders of magnitude.

Full text at www.sciencemag.org/cgi/content/full/323/5920/1429b

RESPONSE TO COMMENT ON "Detection, Stimulation, and Inhibition of Neuronal Signals with High-Density Nanowire Transistor Arrays"

Brian P. Timko, Fernando Patolsky, Charles M. Lieber

Fromherz and Voelker make incorrect assumptions about our experiments that raise serious questions about the validity of their claims. We show that our calibrated signals are consistent with previously published data and a general model with biophysically relevant parameters. Additionally, the wide variation in previously published signal amplitudes suggests caution in applying and drawing conclusions from the models of Fromherz and Voelker.

Full text at www.sciencemag.org/cgi/content/full/323/5920/1429c