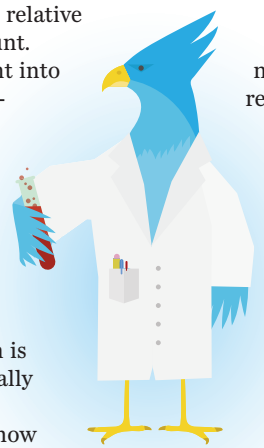
LETTERS

Edited by **Jennifer Sills**

Before the Kardashian Index

IN HER IN DEPTH News feature "Who are the science stars of Twitter?" (19 September, p. 1440), J. You explores the so-called Kardashian Index, defined as the number of followers a scientist has on the social media platform Twitter relative to their academic citation count. While this may provide insight into the profile of scientists engaging in this type of science communication, such an approach misses a larger and much more pressing problem. Although a growing number of scientists are engaging social media as a means of science communication, little information is available on whether it's actually worth our time.



We are largely ignorant of how many people we actually reach, whom we are reaching, and whether or not 140 characters is sufficient to actually change their knowledge about, or attitudes toward, science. However, early evidence suggests that rather than communicating with a broader public, scientists using social media are largely communicating with one another (*1*). Moreover, social media may not even be the most effective means by which to promote meaningful engagement in science, as compared with other web-based approaches (*2*). Until we have a more complete body of research, perhaps we should withhold judgment on whether there is value to actually being a "Science Kardashian."

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Nuanced negative result reporting

A. FRANCO, N. MALHOTRA, and G. Simonovits ("Publication bias in the social sciences: Unlocking the file drawer," Reports, 19 September, p. 1502) present convincing evidence of publication bias in the social sciences. Encouraging publication of negative results will indeed benefit the research community, but the proposed solution of creating repositories or new dissemination channels may do little to dent the "file-drawer" problem of selective reporting of research results.

Preregistration and protocols may prove unrealistic as data sets become larger and richer and data-mining techniques—for better or worse—increasingly supplement the classical single-hypothesis/experiment framework (*1*). Moreover, we have learned from experience that building a new reporting channel will not, in itself, mainstream reporting of negative results (*2*). Technical advances have removed some of the obstacles to the publication of negative results. Digital dissemination is not constrained by the availability of trees. Computational preprocessing—that is, machine sorting of large volumes of text to highlight interesting patterns that can then be checked by a skilled human researcher—may enable us to read and sort through quantities of findings we previously could not handle. For example, researchers from Baylor College of Medicine recently used an automated system to scan 23 million Medline papers and identify more proteins to target for cancer research than human medical researchers typically do in a year (*3*).

However, technology adoption and institutional reform get us only so far. Innovation, incentives, and penalties must go hand in hand with a normative basis for publishing negative results (*4*), and with clear criteria and standards for evaluating them. King notes that it may be difficult to distinguish more from less useful negative results (*5*), but it is not impossible. We must develop a more nuanced view of when, why, and how to report informative null results (*6*).

A single result may contain little truth but much information—even information about what does not work—which moves science forward. A so-called weak result, seen in context, may prove a more valuable, informative contribution than a so-called strong result in isolation.

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Support underway for coastal ecosystems

IN HIS PERSPECTIVE "A global strategy for protecting vulnerable coastal populations" (12 September, p. 1250), E. B. Barbier proposes the establishment of a global emergency task force, combined with international financial support to reduce vulnerability in the long-run, as a means to protect coastal populations from the threats posed by climate change. A disaster task force would be a valuable addition to existing international approaches to climate change adaptation; in fact, the proposed financing of a long-term strategy is already underway.

Barbier lists three objectives for a long-term coastal adaptation strategy: managing risks of costal storms, investing in coastal ecosystems and key infrastructure, and enhancing institutional and community response capacities. These activities conform with the strategic objectives of the Global Environment Facility's (GEF) Adaptation Program (*1*), which serves as a financial mechanism to the United Nations Framework Convention on Climate Change (UNFCCC).

The estimated need of $575 million to support coastal adaptation in the developing world overlooks existing bilateral financing. It also fails to take into account multilateral assistance that already amounts to $247 million: The GEF's Adaptation Program has allocated $139 million for climate-resilient coastal zone management; the World Bank's Pilot Program for Climate Resilience has

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approved $73 million; and the Adaptation Fund under the Kyoto Protocol, $35 million.

Barbier notes that developing economies would benefit from assistance for institutional capacity-building. There already have been substantial efforts in that direction. Fifty least-developed countries have already completed their National Adaptation Programs of Action (*2*), a list of national priority adaptation needs, as a result of the UNFCCC process and financed by the GEF's Adaptation Program. Country parties to the UNFCCC further agreed that, as a next step, so-called National Adaptation Plans will be developed that will mainstream climate change adaptation into broader development frameworks in developing countries (*3*).

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Science and religion: Think local

IN THE 19 SEPTEMBER issue, M. McNutt's Editorial "The Pope tackles sustainability" (p. 1429) and P. Dasgupta and V. Ramanathan's Policy Forum "Pursuit of the common good" (p. 1457) highlighted the important role that religious communities and institutions can have in efforts to mitigate the impacts of anthropogenic climate change. On a global scale, Pope Francis can uniquely engage and orient the minds of many people to the problem of climate change, but a gulf still exists between the scientific and religious communities that cannot be bridged solely by macro-scale efforts.

At smaller scales and within particular religious communities, a general distrust of the scientific community predisposes people to doubt the scientific evidence for anthropogenic climate change. This predisposition must be addressed in order for some people to support the individual and collective socioeconomic changes that are necessary for mitigation. Given that this predisposition likely transcends denominational and theological lines, a unique voice is needed that can simultaneously build trust in these diverse communities and inform about the details of climate change.

I contend that scientists within religious communities are positioned to be this voice. Such scientists have existing relationships with non-scientists in their religious communities that are built on direct lines of communication and trust, making them well-suited for this task. Thankfully, there are already scientists who are leading this effort and providing a model for others to do the same (*1*).

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