LETTERS

edited by Jennifer Sills

Working Toward Meritocracy in Italy

I READ WITH ANGUISH THE "OPEN LETTER TO SENATOR RITA LEVI-Montalcini" by R. Clementi *et al.* (21 March, p. 1615), which was signed by 776 Italian researchers holding temporary contracts, lamenting the lack of stability and meritocracy. As a researcher, clinician, and academician who has worked under different systems in Italy and abroad, I share their concerns. I am fully aware of the heavy limitations of the Italian system. However, as the past Chair of the Health Committee of the Italian Senate, I must take exception to their statement that the left-wing government's intent never went beyond mere words. In my capacity as Senator, I have promoted measures that enhance transparency and meritocracy in the selection of projects and that allocate dedicated resources to young investigators. The 2007 national budget law allocated €15 million to projects submitted by biomedical researchers under 40 years of age. The projects are to be selected by an international committee composed of scientists who are also under 40, and who will judge the proposals strictly on their merits. Another measure, inserted in the 2008 national budget law, designates €81 million to projects presented, again, by researchers under 40 in all areas of intellectual endeavor.

The Italian Senate

True, in spite of the above-mentioned total of €96 million, Italy is still behind in research investment. We invest only 1.1% of the GDP in research, less than the average 2% for Europe, which already compares poorly with the 2.7% for the United States and over 3% for Japan.

Without minimizing the rightful complaint of the Italian researchers, I do not believe that the correct way to proceed is to hire everyone who is currently working with temporary contracts, but to start applying the rules of peer review consistently. By evaluating only on the basis of merit, we will give dignity to valuable scientists, and we will promote the intellectual, economic, and cultural growth of Italy.

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The Emerging World of Wikis

WE NOTED WITH INTEREST THE LETTER "Preserving accuracy in GenBank," (M. I. Bidartondo *et al.*, 21 March, p. 1616) and the related News of the Week story "Proposal to 'wikify' GenBank meets stiff resistance" (E. Pennisi, 21 March, p. 1598). David Lipman's fears that wikifying GenBank "would be chaos" are widely shared, but those fears should be balanced by the realization that individual curators cannot fully encompass the collective expertise of the larger scientific community. Serious users of GenBank use it as a starting point for in-depth analysis with new bioinformatic tools and reviews of more recent work. These users often learn more about the data than the initial depositors or curation staff. This valuable information—hidden in notebooks and rarely published—is being lost to future researchers. A parallel wiki-based structure provides one way of capturing these data.

We are working on such systems, including EcoliWiki (*1*), the community annotation component of EcoliHub (*2*), and a Gene Ontology Normal Usage Tracking System (GONUTS) (*3*), a browser and annotation system for Gene Ontology (*4*). We regard these and similar efforts (*5–8*) as experiments to test wiki-based curation. So far, the challenge is not chaos but lack of participation. Thus, we are also experimenting with curation by undergraduates supervised by an experienced scientist. Integrating annotation and genomics education leverages how we teach critical thinking about the literature, accelerates the pace of curation, and provides institutional incentives for established scientists to participate.

Nevertheless, we understand that changing the GenBank model should not be done lightly. There are well-established expectations about GenBank, and wikifying it could be quite disruptive. Perhaps GenBank could support an arm's length relationship to wikis via the LinkOut service. We look forward to ongoing discussion of how community curation could be added to GenBank. In the meantime, we encourage the 250 scientists who signed the Bidartondo *et al*. letter to help us build wiki-based fungal curation via GO at GONUTS.

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2. Ecolihub (http://ecolihub.org).
3. GONUTS (http://gowiki.tamu.edu).
4. M. Ashburner *et al.*, *Nat. Genet*. **25**, 25 (2000).
5. S. Mathivanan *et al.*, *Nat. Biotechnol*. **26**, 164 (2008).
6. B. I. Arshinoff *et al.*, *Nucleic Acids Res*. **35**, D422 (2007).
7. Wikipathways (www.wikipathways.org).
8. PDBWiki, a community-annotated knowledge base of biological molecular structures (http://PDBWiki.org).

Science 2.0: Not So New?

B. SHNEIDERMAN'S PERSPECTIVE, "SCIENCE 2.0" (7 March, p. 1349), is quite right to identify the value of new observations of human interaction made possible by the advent of the Internet. However, Shneiderman's assertion that these data require some radically new methodology, which he calls "Science 2.0," is apparently based on a misunderstanding of the scope of existing scientific methods.

Shneiderman says that Science 2.0 will address questions of human interaction that "cannot be studied adequately in laboratory conditions," because "the interaction among variables undermines the validity of reductionist methods." Instead, data for analysis must be "collected in real settings." This sounds exactly like approaches that are already practiced, with great success, by researchers in the fields of (to name but a few) ecology, evolutionary biology, geology, paleontology, economics, cosmology, and social science.

Indeed, what Shneiderman calls Science 1.0 has always included methods beyond simple controlled experiments, such as inference from observation of integrated natural systems and the careful use of "natural experiments" (*1*) to test and eliminate competing hypotheses.

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Reference

1. J. Diamond, *Science* **294**, 1847 (2001).

Response

I AGREE THAT THE NATURAL SCIENCES ARE based on more than just replicable, controlled laboratory experimental studies, and that observational methods play a key role in the natural and social sciences (*1*). However, the interventional methods as practiced in design science studies of sociotechnical systems have novel elements. In addition to "natural experiments," such as when the FaceBook managers change the deletion rules or eBay administrators update their fraud control mechanisms, I was advocating research-oriented interventions to develop predictive models.

Amazon and NetFlix designers conduct many studies to improve their user interfaces

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Letters to the Editor

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