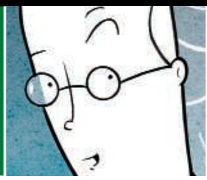

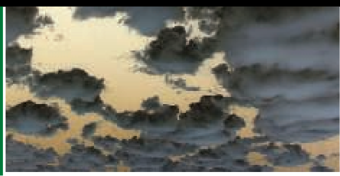

LETTERS

edited by Jennifer Sills

Painful Publishing

BIOMEDICAL SCIENCE HAS NEVER BEEN MORE EXCITING OR PRODUCTIVE. RESEARCH TOOLS have become increasingly powerful, and progress continues to accelerate. Yet, these are stressful times for many biomedical scientists, because competition for grant support, jobs, and publishing in the most prestigious journals is also accelerating. The stress associated with publishing experimental results—a process that can take as long as obtaining the results in the first place—can drain much of the joy from practicing science.

One problem with the current publication process arises from the overwhelming importance given to papers published in high-impact journals such as *Science*. Sadly, career advancement can depend more on where you publish than what you publish. Consequently, authors are so keen to publish in these select journals that they are willing to carry out extra, time-consuming experiments suggested by referees, even when the results could strengthen the conclusions only marginally. All too often, young scientists spend many months doing such "referees' experiments." Their time and effort would frequently be better spent trying to move their project forward rather than sideways. There is also an inherent danger in doing experiments to obtain results that a referee demands to see. Although we emphasize these problems with regard to the highest-impact journals, the same problems occur with other journals.

"The stress associated with publishing experimental results…can drain much of the joy from practicing science."

It is surprising that so many referees make unnecessary demands, as they are authors themselves and know how it feels when the situation is reversed. Such demands are discouraging for young scientists and, cumulatively, slow the progress of science. Of course, peer review is critical for making sure that the authors' conclusions are sound, and some referees' experiments would substantially advance the story. But frequently, these would justify an additional paper. Science advances in stages, and no story is complete.

What can be done to speed up the publication process and make it less agonizing and more efficient? Both editors and referees could help. Referees need to be more thoughtful when recommending additional experiments and to make sure that these experiments are truly needed to justify publication. Editors should insist that reviewers rigorously justify each new experiment that they request. They should also ask reviewers to estimate how much time and effort the experiment might require. With this information in hand, editors can more easily override referees' excessive demands. This requires confident, knowledgeable, and experienced editors, and it risks alienating referees, who are often hard to come by. Nonetheless, editors should be encouraged and empowered to perform this crucial task.

A more radical solution, which is already used by some journals, is to have editors and their relevant editorial board members triage papers so that only those that meet the criteria of interest, novelty, and importance appropriate for the journal are sent out for formal review. This will save reviewers' time. In addition, papers that clear this initial hurdle can then be reviewed solely for scientific accuracy, appropriateness of controls, clear writing, and justification of the conclusions.

Published papers are the currency of science, and scientists need to do more to make the publishing process more rapid, rational, and equitable, as well as less painful and frustrating. We scientists have created the problems discussed here, and it is up to us to fix them.

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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.

The Enemy Within

THE NEWS OF THE WEEK STORY BY D. GRIMM on "Staggering toward a global strategy on alcohol abuse" (16 May, p. 862) nicely illustrates the uphill battle that the World Health Organization faces in dealing with global health issues. I was dismayed (but not surprised) to learn that several countries (including the United States) insisted that the Director General of WHO include the alcohol industry in discussions to shape global strategy concerning alcohol abuse. The alcohol industry is equivalent to the "vector" for alcohol-induced disease. Inviting this industry to the discussion table regarding attempts to curb alcohol-related deaths is analogous to inviting the mosquito to participate in discussion concerning the control of malaria.

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The Limits of Water Pumps

WATER STRESS IS A MAJOR PROBLEM AFFECTing the future of human societies around the world, particularly in the rural areas of the developing world (*1*, *2*). The Newsmakers article "Barren to lush" (2 May, p. 593) highlighted an award for the invention of a new manual pump used for irrigation in rural Africa. We fully respect and admire the invention of efficient and affordable pumping systems to solve water-shortage problems in rural areas. However, we are concerned about the intensive application of these new pumps to water-limited systems, where the extraction of

Deciding under influence

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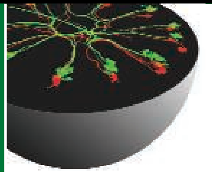

Transience in neuronal networks

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groundwater and its use in agriculture could be unsustainable, despite the recognition of this new technology with an Award for Sustainability (as noted in the Newsmakers item). The irrigation pump will undoubtedly bring short-term benefits, but it could have adverse long-term consequences. First, groundwater pumping can deplete the limited groundwater. Second, the extraction of groundwater and its use for irrigation increases soil evaporation, which, in turn, may increase soil salinity and unproductive water losses. Third, in coastal areas groundwater pumping causes seawater intrusion. All of these situations are examples of how intensive groundwater extraction in areas with only limited recharge rates may lead to an unsustainable use of the landscape.

This is also true in many pastoralist societies, where the increase in water availability often leads to the overgrazing of rangelands. The case of Botswana is representative of other rural parts of Africa. For example, in the Kgalagadu District, the number of boreholes increased from 8 in the 1950s to more than 380 in the 1990s (*3*), resulting in higher rates of livestock production, overgrazing, and consequent land degradation.

We think pumps are good for solving short-term drinking water shortages. However, new technology aiming at solving the long-term agricultural water shortage in rural regions should focus on more efficient use of natural rainfall (e.g., efficient rainfall collectors and reduction of soil evaporation) or wastewater reuse. In this way, science and new technologies can move in the same direction.

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References

1. J. Yeston, R. Coontz, J. Smith, C. Ash, *Science* **313**, 1067 (2006).
2. A. Tal, *Science* **313**, 1081 (2006).
3. D. S. G. Thomas, C. Twyman, *Land Degradation Dev.* **15**, 215 (2004).

Omissions in GLAST Story

IN THE NEWS FOCUS STORY "GLAST MISSION prepares to explore the extremes of cosmic violence" (23 May, p. 1008), Y. Bhattacharjee committed two grave oversights.

First, no mention is made of any contribution to GLAST from outside of the United States. In fact, Italy, France, Sweden, and Japan all made essential contributions. The Large Area Telescope, for example, was essentially made and paid for by Italy, France, and Sweden. Japan supplied most of the necessary silicon. Scientists from these countries have been, and continue to be, essential members of the GLAST team.

Second, the figure on page 1009, which provides a brief summary of high-energy astronomy missions, omits two important missions: Italy's (and Holland's) BeppoSAX (1996 to 2002) and Italy's AGILE. BeppoSAX has substantially added to our understanding of gamma-ray bursts and hard x-rays; the BeppoSAX team was awarded the 1998 Bruno Rossi Prize of the American Astronomical Society. AGILE is also dedicated to x-ray and gamma-ray astronomy and uses the same silicon type of detectors that GLAST will use. Now in orbit for more than a year, AGILE is certainly a precursor to (and pathfinder for) GLAST.

As a final clarification, in the same figure, the Swift mission is a joint trilateral mission with NASA, Italy, and the UK, not NASA alone, as indicated.

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LIFE IN SCIENCE

Frogs on a Plane

In the early days, one of the subjects of our research was the *Engystomops* frog, a tiny creature known for its brown pustular skin (*1*). When the lab moved from New York City to California in 1971, a young assistant named Bill was entrusted with transporting the frog colony to its new home. After painstakingly sifting through all the dirt in our "Little Panama" culture room, he placed the frogs in aquaria. He decided that it would be safer to carry the frogs onto the airplane with him than to trust them to checked luggage. So the morning of the flight, he carefully put the frogs into plastic bags with water and air, and then placed each bag into his carry-on suitcase. Unfortunately, despite his meticulous planning, there was one thing he forgot to take into account.

As soon as the plane took off, the change in air pressure caused the bags to burst. Of course, Bill couldn't help opening the carry-on to see how bad the situation was. When he saw what had happened, he asked every flight attendant he could find for glasses of water that he could use to refill and retie the bags. But he was too late: Out jumped the frogs. Bill and the startled flight attendants raced around the plane, crawling under seats and down the aisles to apprehend the little creatures. Baffled passengers looked on, trying to determine the source of the commotion.

Fortunately, there was a happy ending to this little adventure. Eventually, the frogs were caught and transported safely to our California lab, where they would prosper for many years to come.

EDITOR'S NOTE

This will be an occasional feature highlighting some of the day-to-day humorous realities that face our readers. Can you top this? Submit your best stories at www.submit2science.org.

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Reference

1. Search for *Engystomops pustulosus* on http://amphibiaweb.org; don't miss the mating call!

CREDIT: PETER HOEY

Painful Publishing

Martin Raff, Alexander Johnson and Peter Walter (July 4, 2008)

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