Engineering News (http://cen.acs.org/articles/91/i44/ACS-Expands-Open-Access.html), authors and funding agencies paid fees for only 1% of articles to make them freely accessible. The article reported four initiatives that ACS hopes will encourage more authors to select open-access options: a new open-access journal, a daily lottery to make one article freely available, an expanded menu of author licensing options, and credit toward future open-access fees.

We need to step back and ask, Of the people who do not currently have access, what access do they need? Advocates insist on policies to ensure that all members of the public receive timely, free, online access to articles and data reporting on the results of taxpayer-supported research. But there actually is no crisis of access. Publisher bundles to libraries provide readers with access to more titles than ever before. Many subscription journals now have author-choice hybrid open-access publication models like ACS's. The number of open-access journals is increasing, as is the number of papers made freely accessible through authors' self-archiving. Various programs provide free access to back files and to papers selected by editors as having important disciplinary implications. Given the many potential audiences, who actually is underserved?

If the mandating of open access is justified, the process for offering it must be open and transparent. In my experience, most working scientists and engineers have yet to be engaged in that process. Open-access embargoes must match discipline-specific data on journal half-lives. Through an initiative called CHORUS (Clearinghouse for the Open Research of the United States), many publishers have already established a virtual, interactive private-sector repository containing the resources of publishers.

Scientific societies have a special place in maintaining a vigorous research enterprise by reinvesting publishing revenues in the science community. Well-intended plans to alter the publishing environment without considering societies will endanger this engine of scientific productivity. To avoid damage to societies and the communities they serve requires a gradual transition, a stable open-access funding stream, and recognition and valuation of scientists' intellectual investment.

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Letters

Demilitarizing weapons-grade plutonium

The news story about stockpiled weapons plutonium (PHYSICS TODAY, July 2014, page 24) was limited to federal budget expenses for demilitarization. Another part of the equation is that direct income from sales as fuel would help offset expenditures for conversion, not to mention the enormous indirect value for nuclear arms reduction and nonproliferation.

The 20-year joint US–Russia Megatons to Megawatts program for demilitarizing 500 tons of weapons-grade uranium proved at its completion in 2013 to be an on-schedule winner—in mutual arms control, economics, and nonproliferation. About 20 000 Soviet nuclear warheads were effectively converted to civilian reactor fuel that supplied half of US nuclear power plants and now produces as much as 10% of US electricity. The program readily paid for its federal budget outlays, and it reduced national and international nuclear risk—a swords-into-plowshares paradigm.

The Russian Federation is now on track to convert 34 tons of weapons plutonium into peacetime energy, as long as the US carries out a comparable inventory reduction according to a 2001 agreement between the two countries. Altogether, that would correspond to irreversible reduction of 10 000 or so nuclear weapons from the US arsenal.

On the wholesale market, 34 tons of weapons-grade plutonium might eventually fetch as much as $3 billion, equivalent to $30 billion in taxable retail sales. Even if costs for the 60%-completed South Carolina mixed-oxide (MOX) fuel facility inflate, multiple national and international benefits of plutonium conversion would outweigh the extra costs.

Moreover, the irrevocable demilitarization of weapons plutonium would reduce the risk of international proliferation and nuclear terrorism. Whether MOX is reactor grade or weapons grade, its burnup—using the processed fuel to generate electricity—adds physical, chemical, radiological, and isotopic barriers that reduce accessibility and utility. European nations have gained relevant experience in MOX burnup for both reactor- and weapons-grade plutonium. Once converted to MOX, the reactor fuel is no longer usable in nuclear weapons,

a technical detail never contradicted by specific nuclear-test technical data.

The MOX weapons-conversion program would help the US comply with its international obligations toward worldwide reciprocal nuclear disarmament under article VI of the Nuclear Non-Proliferation Treaty. Such a move would present a commendable example for the other weapon states—the UK, China, and France.

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Unusual wind effect on a lake-surface monolayer film

Joe Greene's article "Organic thin films: From monolayers on liquids to multilayers on solids" (PHYSICS TODAY, June 2014, page 43) brought back some memories for this retired atmospheric scientist. When I first entered graduate school at Colorado State University, I was part of a team that was testing early versions of IR surface-temperature-measuring devices. The US Bureau of Reclamation was testing the ability of a monomolecular layer, a mixture of hexadecanol and octadecanol, to reduce evaporation from low-altitude reservoirs—in this case, Lake Hefner, which held a good portion of Oklahoma City's water supply.

We did observe the reduction effect. However, we would have profited by reading Benjamin Franklin's description of his Clapham Common experiment presented in the article, because the reduction effect was definitely dependent on wind speed and direction. Applied during a calm, high-pressure, sunny day, the film reduced evaporation. However, when wind would pick up, it would blow the film to the lee shore or churn it into the lake's upper layer, which had been warmed by sunlight and the reduced evaporation.

With the film no longer protecting it, that warm upper layer evaporated like crazy due to the nonlinear effect of the Clausius–Clapeyron relationship during a hot summer day at slightly above sea level. Thus the net effect of the hypothetically evaporation-reducing monomolecular layer was to increase evaporation. Although a solution to that negative effect was described (but never implemented), the experience was fundamental to the skepticism I have enjoyed in my scientific career: The result was completely unexpected to a young scientist and was revealed by a true field experiment denying the prominent hypothesis. It also got me my first publication—in the *Journal of Geophysical Research*, volume 74, page 2471, 1969—and an MS degree.

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Dusting off a comet

I offer a very minor correction to the fascinating article "Making the Moon," by Dave Stevenson (PHYSICS TODAY, November 2014). On page 35, Stevenson writes, "the Moon remains the only body from which we have returned samples." That neglects the Stardust mission, which successfully returned a sample of dust from Comet Wild 2 in 2006.

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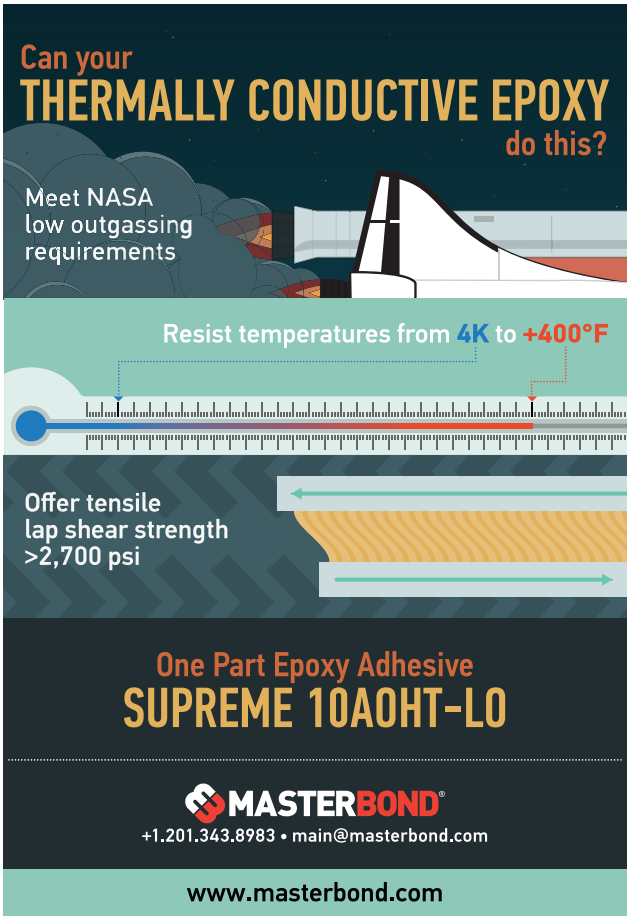
Correction

December 2014, page 19—Figure 2 was adapted from A. Miyawaki, *Nat. Rev. Mol. Cell Biol.* **12**, 656, 2011. ■



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