Problems and Opportunities (Blizzards and Beauty)

What makes you interrupt important work? We all have our provocations and temptations. For me, two recurring excuses are very bad weather and very good weather. A blizzard will make me drop everything and shovel snow. A beautiful moment of late-afternoon sunlight will make me drop everything and take pictures. Your answers may fall into roughly the same two categories, which we could call solving problems and seizing opportunities.

I think about OA in the same terms, perhaps because it's interrupting my work in philosophy. There are two deep reasons to pursue OA, even to interrupt important work to pursue it: to solve problems and to seize opportunities. They're not the same thing. One is duress and one is pleasure. One is a push from behind and the other a pull from the front. We work on problems with dutiful determination and on opportunities with creative unconstraint. Even when they stress us, there's a difference between worry that a nagging problem will persist and worry that a beautiful opportunity will slip through our fingers.

I'd like to think that we'd pursue OA even if historical circumstances gave us only one of these motivations rather than both at once—that is, if we suffered from access problems and had no new technology to exploit, or if we had a spectacular new technology to exploit but no particular problem to solve.

But we have both and we should acknowledge it more often. Too much of our conversation is problem-oriented. Let's complement it with a conversation that is opportunity-oriented.

Yes, OA solves problems. There's the access-to-authors or knowledge problem for readers. There's the access-to-readers or impact problem for authors. There's the

affordability problem for libraries. There's the unfairness problem of making taxpayers pay a second time for access to research they funded. There's the inefficiency problem of funding useful research that isn't accessible to everyone who can make use of it. There's the perversity problem of making a public commitment to use public money to expand knowledge and then hand control over the results to businesses who believe, correctly or incorrectly, that their revenue and survival depend on limiting access to that knowledge.

Then there are the problems arising from the subscription business model itself. The chief problem is not that subscriptions cost money, because the alternatives also cost money. It's not even that subscriptions in the sciences cost a *lot* of money. The subscription model has problems even if we assume that the OA alternative will cost exactly the same (which I don't think is true). The subscription model makes a publisher's method of cost recovery function as an access barrier. It requires artificial scarcity for information when digital technologies can abolish information scarcity altogether. It makes publishers insist on controlling access to research they didn't perform, write up, or fund. It makes them act (to use the wonderful PLoS analogy) like midwives who insist on keeping the baby rather than midwives who deliver the baby, hand it back to its parents, and take payment for services rendered. It means that after publishers add value through peer review and copy editing, they feel financial pressure to subtract value by imposing password barriers, locking files to prevent copying or cutting/pasting, freezing data into images, cutting good articles solely for length, and turning gifts into commodities which may not be further shared. Because journals don't publish the same articles, they don't compete for readers or subscribers (even if they compete for authors), removing market pressures for publishers to keep subscription prices low or even correlated with their size, costs, impact, or quality.

The subscription model doesn't scale with the explosive growth in the volume of published research, and it wouldn't scale even if prices were low. It entails that as the volume of published research grows, the accessible percentage of it for the average library shrinks, and that the faster the literature grows, the faster the accessible percentage shrinks. It means that despite their growing access gaps, libraries end up paying for bundles of journals when local patrons only use a subset, and whole journals when they only use certain articles. It means that when they pay for electronic journals, which are increasingly replacing print journals, they license rather than own copies and suffer under licensing terms and software locks that limit usage much more than they were ever limited in using paper journals. It means that subscribers pay for more than they need and get less than they need, a problem severely aggravated by hyperinflationary price increases. Finally, it means that different universities pay redundantly for access to the same literature, instead of sharing the costs so that each pays for part and together all pay for all.

There's a lot of snow to shovel here. But …

There are also beautiful opportunities to seize. There's the fact that the internet emerged just as journal subscription prices were reaching unbearable levels. There's the fact that the internet widens distribution and reduces costs at the same time. There's the fact that digital computers connected to a global network let us make perfect copies of arbitrary files and distribute them to a worldwide audience at virtually no cost. There's the fact that unrestricted access to digital files supports forms of discovery and processing impossible for paper texts and DRM-clamped digital files. There's the fact that for 350 years, scholars have willingly (even eagerly) published journal articles without payment, a custom that frees them to consent to OA without losing revenue. There's the fact that OA is already lawful and doesn't require copyright reform, even if it would benefit from reforms of the right kind. There's the fact that OA is within the reach of authors acting alone and needn't wait for publishers, legislation, or markets. There's the fact that, for researchers acting on their own, the goal of OA is even easier to accomplish than the goal of affordable journals.

Let me elaborate on one of these opportunities a bit. The Budapest Open Access Initiative said that "[a]n old tradition and a new technology have converged to make possible an unprecedented public good. The old tradition is the willingness of scientists and scholars to publish the fruits of their research in scholarly journals without payment … The new technology is the internet." OA is the name of the beautiful opportunity created by this convergence of the willingness of scholars to give away their work and the existence of a medium for delivering that work at vanishing marginal cost to a worldwide audience. If you have the willingness of authors but not the medium, then you have scholarship in the age of print. If you have the medium but not the willingness, then you have music and movies in the age of the internet (so far). The beautiful opportunity for researchers is that we now have both.

Here's a less obvious but even more fundamental opportunity. Knowledge is "non-rivalrous" (to use a term from the economics of property). That means we can share it without dividing it, and consume it without diminishing it. My possession and use of some knowledge doesn't exclude your possession and use of the same knowledge. By contrast, familiar physical goods like land, food, and machines are all rivalrous. To share them, we must take turns or settle for portions.

We're very fortunate that knowledge is non-rivalrous. We can all know the same facts or ideas without my knowledge blocking yours or yours blocking mine. We're even more fortunate that speech is non-rivalrous, since this allows us to articulate and share our knowledge without reducing it to a rivalrous commodity. We can all hear the same spoken words without my listening blocking yours or yours blocking mine.

But for all of human history before the digital age, writing has been rivalrous. Written or recorded knowledge became a material object like stone, clay, skin, or paper, which was necessarily rivalrous. Even when we had the printing press and photocopying machine, and could make many copies at comparatively low cost, each copy was a

rivalrous material object. Despite its revolutionary impact, writing was hobbled from birth by this tragic limitation. We could only record non-rivalrous knowledge in a rivalrous form, much as we could only translate one poem into a different poem.

Digital texts, however, are non-rivalrous. If we all have the equipment to support them, then we can all have copies of the same digital text without excluding one another, without multiplying our costs, and without depleting our resources. Digital writing is the first kind of writing that does not reduce recorded knowledge to a rivalrous object.

I've heard physicists refer to the prospect of room-temperature superconductivity as a "gift of nature." Unfortunately, it's not quite within reach. But the non-rivalrous property of digital information is a gift of nature that we've already grasped and put to work. We only have to stand back a moment to appreciate it. To our ancestors, the prospect of recording knowledge in precise language, symbols, sounds, or images without reducing the record to a rivalrous object would have been magical or miraculous. But we do it every day now and it's losing its magic.

The danger is not that we already take it for granted but that we might stop short and fail to take full advantage of it. The point is not to marvel at its potential but to seize the opportunities it creates. It can transform knowledge-sharing if we let it.

We take advantage of this gift when we post information online and permit free access and unrestricted use for every user with an internet connection. But if we charge for access, enforce exclusion, create artificial scarcity, or prohibit essential uses, then we treat the non-rivalrous digital file like a rivalrous physical object, dismiss the opportunity, and spurn the gift.

I don't want to create an artificial distinction between solving problems and seizing opportunities, which are intimately connected. In our case, we're solving access problems by seizing the opportunities created by digital computers connected by digital networks exchanging non-rivalrous digital information. So if you're working on solving a problem, don't stop. But if you find yourself thinking that the task of promoting OA is just a battle against problems, take a step back. It's a lot more than that. It's also the creative and open-ended process of seizing a beautiful opportunity.

This dual perspective matters for morale. It also matters for strategy, since it affects our conception of the goal and our conception of who our natural allies are in the larger cause of taking advantage of the opportunities created by digital information and digital technology. It affects our horizons.

When publishers argue that there are no access problems, and that we shouldn't fix what isn't broken, there are two answers. First, that's mistaken; there are deep and serious access problems. Publishers who really don't know this should talk more to the libraries who subscribe to their journals, and even more to the libraries who don't. But second, leaving that quarrel entirely to one side, there are good reasons to pursue OA anyway, even reasons urgent enough to interrupt important work.