

An explosion of alternatives

Considering the future of science journalism

Paige Brown

On Friday March 11, 2011, a violent earthquake off the coast of Japan rocked the ocean floor and triggered a devastating tsunami that crashed into parts of the Japanese coast just 30 min later. In New York City, Angela Cesaro, then an editor at *Scientific American*, saw the first tweets reporting the quake around 3:00 am in the morning. She immediately retrieved material from *Scientific American's* archives on the science of earthquakes on the ocean floor, as well as the tsunamis, aftershocks, and other impacts that can result. "She had that information up on our website before she went to bed," said Mariette DiChristina, *Scientific American's* current Editor in Chief. "We were hours ahead of others."

As DiChristina tells it, timeliness always has and always will win the day. In the past, journalists would rush out to cover news they heard breaking over the radio or by word of mouth. Today they do the same, but the first accounts of major events often now break on Twitter. "[W]hen something happens, like the 2011 earthquake in Japan, you want an authoritative source to tell you what's going on," DiChristina said. "Our online traffic doubled, and a lot of those people kept coming back because they had a need, and we addressed it immediately. We could never have done that once upon a time." And yet, the digital world is turning out to be both a blessing and a bane for many news publishers. "Now the news is updated continuously around the clock, and that puts a certain amount of timing pressure on the press," DiChristina said. "I remember a breaking story at one point, and people were tweeting to me: 'hey, it's been five hours, where's the update?' [...] Our expectations for instant answers is certainly much greater than it was even 5 years ago." Journalists today struggle not just to obtain

information quickly, but to obtain *credible* information quickly.

Scientific American is just one of many traditional publications facing the pressures of audience expectations of immediacy in a digital world. Moreover, the lines between sources, journalists and audiences are increasingly blurred by blogs and social networks, such that readers today often expect to be a *part* of the story. With so much competition and change underway, the major question among professional journalists is whether science journalism, as it has been, is slowly dying out. But the grass looks greener on the other side of the journalism fence. Quality content has become king for readers who now look more to the story and the byline, regardless of the platform, than to the publication's reputation.

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In Dan Fagin's opinion, to best understand the current state of science journalism, we need to strip away the misconceptions of future and past: that is, the idea that science journalism will be utterly unrecognizable in the next 5 years and that it was calm and steady 5 years ago. "What there really is, is constant change," said Fagin, Director of the Science, Health and Environmental Reporting Program at NYU, and winner of the prestigious Pulitzer Prize for his book, *Tom*

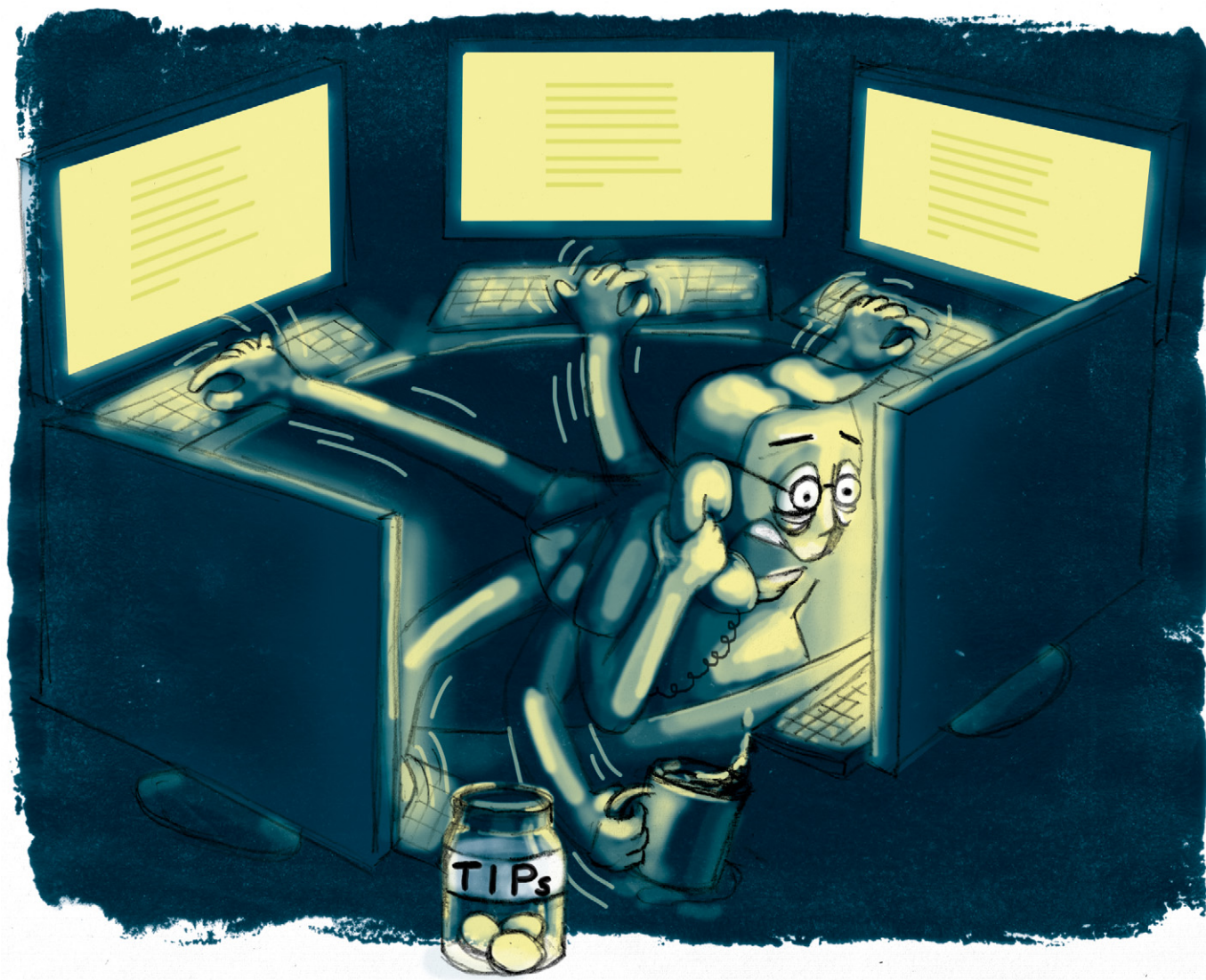
River: A Story of Science and Salvation. "However, obviously, the fundamental change that has occurred in all of journalism—and science journalism is just one corner of that—is that we're all networked now, via the web, and there are virtually no barriers to entry to be a storyteller, as there used to be. [...] What that means is that more people are able to see our work than ever before; but conversely, because so many people are able to see our work and because there are so many different choices, it becomes difficult to monetize that."

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As a result, the landscape of science journalism is changing from being dominated by a few professional media organizations with full-time staff, to a much more diffuse system where content is delivered by people being paid per job, or by bloggers and other contributors being paid very little, if anything at all. According to Fagin, content also increasingly comes directly from experts in particular areas, often scientists. "Those people will increasingly be delivering information directly," he said. "And that makes perfect sense, because when you have a horizontal, diffuse system of information, people have many choices. [...] They're going to choose authoritative



sources that they can be confident in. They want people not just to tell us what happened, but to tell us what it means, where it fits into the broader context—why it's important, or why it's not important."

But while online science writers increasingly become experts in a narrow subject area, Mike Spear, director of Communications for Genome Alberta, a not-for-profit funding organization that supports a new Canadian science blogging network (<http://scienceborealis.ca/>), worries about the disappearance of trained science journalists who can cover a wide range of topics and fill a growing gap between dedicated experts and generalist reporters. "You've got writers who are too much into their subject area that they end up doing stories in a vacuum that doesn't have enough context around it to say 'here's why this story is important',

or 'here's how it should inform policy,'" he said. "So what I think we lack and what we need more of are those people in the middle, who have a general understanding of society and culture, and how people learn and why people read newspapers, and who are good writers themselves, but who also have enough of that science inside them to understand and translate it."

One problem is that in the absence of professional journalists, the quality of science coverage will become highly dependent on the skills and dedication of individual experts who are interested enough to write about their subject. A related problem is that this is leading to fragmentation of science coverage and where it is published. Fragmentation in turn is making a career in science journalism

harder. Many media organizations are dropping their formal coverage of science at the same time as the number of science writers and the *amount* of science story content online are exploding. Sharon Dunwoody, Evjue-Bascom Professor Emerita in the School of Journalism and Mass Communication at the University of Wisconsin-Madison, USA, cites the obvious trend that the number of science journalists fully employed by media organizations is much smaller today than it was 10 years ago. "I think it's very, very hard to be a science journalist today," she said. "That entrepreneurial requirement is forcing journalists to develop a highly varied portfolio of products, and to try to make money off of those products, whether it's a blog that they maintain on a regular basis, or a more traditional freelance environment. It also requires—and this is a

skill that I certainly didn't think much about early in my teaching career—entrepreneurial skills. How do you market yourself? How do you develop a *brand* when you do have a significant product like a book? How do you make that product obvious and available to a variety of audiences?"

Many science communicators, when asked to qualify what they mean by the "death" of science journalism, point out that these developments actually benefit the consumer. "We have to better define the problem here. Are we talking about the value that comes to readers? If one reader over here is reading a really good blog on science, and this reader over here is reading another really good blog, then I don't see why we have to wring our hands that they're not all watching the same nightly news program that was simplistic and not very good on science anyway," Carl Zimmer, *New York Times* columnist and popular science writer and blogger, said. "It's a great honor for me to write for the *New York Times*, one of the leading newspapers in the world. But [...] if a bunch of people go off and read other things, I can't just say, 'Oh, we all need to be reading the same newspaper or everything's going to fall apart'. [...] This notion of some sort of centralized media was just a funny little fluke of the late Twentieth Century, and there's no reason to cling to it as the thing we all need."

Patterns of news consumption are also changing, including for science news. "Nobody is particularly loyal to any one news source, or at least your media diet is constructed in a very different way today than it was 10 or 15 years ago," said Bobbie Johnson, previously *The Guardian* newspaper's technology correspondent in London and now co-founder of and writer at Matter, a dedicated science journalism site published by Medium.com (<http://medium.com/matter>). Readers or viewers today are less prone to return to specific media outlets, but will increasingly follow a familiar writer wherever on the Web they publish. "So right now, in my old fashioned world, I can pay attention to—and I will continue to do so—the *New York Times*, the PBS News Hour, several magazines whose work I have long valued like *Science* and *The Atlantic*," Dunwoody said. "But as a reader, viewer, listener, I now have to also start paying attention to who is writing those stories."

Today, journalists like Zimmer have a whole host of other content across digital and hard copy formats. Readers follow Zimmer from his *NYTimes* column to his blog, to his Twitter feed, and to his work for other publications. "I think this is going to evolve into less a world of, 'if it's in the *New York Times* it must be true', to a world that 'if Deborah Blum writes about it, or Andy Revkin writes about it, that's what I'm going to pay attention to'," Dunwoody said. The big question, she said, is whether science reporters can continue to make a living as they once did. "I'm enjoying it as a consumer, but is this a world where [any given journalist] can actually make a living? I'm not sure I know the answer to that."

Zimmer agrees that writers trying to forge careers around science journalism are facing a slog. "Sometimes when people are wringing their hands about the death of science journalism, what they really mean is the death of science journalism *jobs*," he said. "That's a real problem. But that's different than the experience of people reading science journalism. Now, as a reader, you have a choice of where you want to read about science, and it may be difficult to support such a huge industry when people are not restricted to their local distribution network."

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Do these changes mean that the quality of science journalism has gone down? "It's not an automatic equation," Zimmer said. "If you're getting overpaid to write garbage, it's still garbage, no matter what you get paid. But I think if you look at a lot of the digital places where science and related subjects are being covered, they're paying because they see some value in having good writing."

The real question, Dunwoody says, is whether innovative news structures can evolve that can provide opportunities and sufficient pay for excellent science journalists and journalism. "Right now, the field is

experimenting with those structures, everything from non-profit organizations to more for-profit all online organizations," she said. "Until that shakes out, we really won't know what will work out, and what won't."

The problem is that science news is not popular with advertisers compared to business, consumer technology and entertainment news. Just as you would never see a family-focused company buying advertising space against a violent crime news story, many advertisers choose not to place ads in the science section of newspapers and news sites. "Science is hard to do well, and it's hard to pay for it," said Evan Hansen, previously editor at *Wired.com* and currently senior editor at *Medium.com*. "Brands often don't see much value in associating with science writing. [...] So even though the audience is there for science—it's always extremely popular stuff, people are curious about it, and I think people understand how powerful it is and how deeply it affects our society—advertisers don't like it."

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Hansen, along with many others, thinks we will therefore see a shift toward expensive, investigative science reporting done as non-profit journalism. "I think *National Geographic* is an example [...] *Mother Jones* does a lot of science reporting—non-profit," Hansen said. "If you look at the science columns in *The Guardian*, *The Guardian* is run by a trust, it's a not-for-profit newspaper. And they have *great* science in there. And I think one of the reasons they do is because they are a trust—they take a different view and therefore they can get away with doing something different."

The recently launched Mosaic publication, supported by the Wellcome Trust, is another example of this model. "It's about trying to fill what I think is a gap in the market for science features, in what I hope is quite an innovative way," said Mark Henderson, head of communications for the Wellcome Trust in an interview with Matt Shipman, a SciLogs.com blogger (http://www.scilog.com/communication_breakdown/henderson-mosaic/). "[O]ur thought at the Trust is that we can fund some of this ourselves, directly. We're publishing a

long-form feature every week, mostly from freelancers, and then publishing them under a Creative Commons license.”

The rise of new digital-only platforms such as Mosaic, Atavist and Medium, which feature long-form science journalism pieces ranging from 2,000 to 8,000 words and longer, might puzzle those who worried 5 years ago that, as people started reading their news exclusively online, long-form journalism would suffer. “That may have been true when monitors were bad, and design was bad, and fonts were bad, but then they got better,” Zimmer said. “A lot of my own work these days is long stories. It is definitely expensive to do in-depth reporting, and I think across the board, there is a challenge about that. But right now, I still see the evidence for lots of long-form science journalism.”

According to Hansen, Medium is currently operating somewhere between a self-publishing model, like a blog, a foundation-funded journalism model, and a for-profit model. Matter, a place for investigative science reporting on the Medium platform, is currently not making any money. “But science is just a fraction of what we do on Medium,” Hansen said. “Again, it’s very popular. We’ve brought in some people to write for us on commission, and we also have people writing about science for their own reasons, using the platform.” Yet, Medium still has to figure out a way to monetize not just science writing, but all types of writing on the platform. The goal is to build a revenue model that will reward excellent writers on the platform, for example, by giving writers tools to make money on their content, similar to the way Google AdWords and YouTube are starting to support content creators.

Whether the modern day news organizations choose to focus on traditional or digital formats, long-form journalism or short news stories, one thing is certain: they are focusing on their strengths, *not* on producing everything for everyone. As an example of this atomization and specialization of the media, Ezra Klein, an analyst, columnist and television commentator who ran *The Washington Post*’s Wonkblog, recently left to join Vox Media, an online publisher focused on developing high-value digital journalism such as technology stories at *The Verge*. “What is Vox Media really about? It’s about

niche, finding a niche and doing it really well,” Fagin said. “It makes sense that people are going to establish a niche and build an audience that know this is a good place to go for a certain type of information. What they are not going to do, if they have any sense, is to try to be a full service shop. A few legacy media brands may be able to pull that off—the *New York Times*, the *Economist*, a few other places—but for everybody else, the place is too crowded for that.”

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In addition, long-standing news organizations such as the *New York Times* or *Scientific American* are increasingly focused on addressing audience needs and bringing science content to readers in multiple formats. “You can experience *Scientific American*’s brand in any way you like,” DiChristina said. “You want a 2-min video? We’ve got that. You want a book? We’ve got that. You want 60-second science? We’ve got that too! The trick is, you find out what your audience needs. Be obsessed with what they need, and give it to them in the ways they want it.” *Scientific American* produces more than 3,000 items every year, including traditional feature articles, news stories, videos, podcasts, slideshows and other digital and social media content. This number is triple that of output in 2009, DiChristina explained, and has been accompanied by an explosion in Web traffic. In 2011, *Scientific American* added a blog community, recruiting scientists as well as professional science writers and journalists. “The journalist’s job is certainly expanded—I think it’s much less boring, which is great,” DiChristina said. “But now it’s even more intense, I would say, and more challenging, because you’re trying to deal with a variety of media at the same time as you’re trying to deal with an expectation for fast response to breaking news.”

The wider media landscape could help to revolutionize how newspapers deliver their content, whether in print or digitally. “[W]hat was interesting to me as someone who came through that tradition, was the frustration of the constraints that news formats involve—stories not being given the depth of coverage that they need, or, even when you’re producing a successful website, that there’s no connective thread between different stories,” said Johnson, who started off at the *Evening Standard*, a large newspaper in London, and then moved to *The Guardian*. “You might be writing about the same topic, yet there is often not much sense of connection between different updates on the same topic.” In other words, a feature story is often delivered in the same way as a 100-word news story: It looks the same, feels the same, reads the same. “One of the issues about science journalism, I think, is that it’s often very random, and spread very thinly,” Johnson said. “We’ll publish 100 things, and if one of them is a success, then that’s great. A print magazine is similar: ‘here’s a package of stories, here’s a package of bits of entertainment, and we think you might like a few of them’. [...] But we just thought that that ends up spreading resources too thin. So at Matter, we try to be careful about our resources and the decisions we make, and we’re much more interested in connecting with a sizeable but engaged audience.”

Matter’s ultimate ambition, Johnson said, is to engage in conversations that give readers the tools to understand changes that are happening or problems they will face in the future. One such recent story, *Is the Internet good or bad? Yes* (<https://medium.com/matter/76d9913c6011>), was pursued after editors crowdsourced the topic from reader comments. In order to better foster these conversations, Matter is breaking some of the rules of legacy media formats, including allowing readers to annotate digital stories. “There are really good reasons why some things are done in journalism, and there are also really stupid, dumb reasons why other things are done,” Johnson said. “Nearly all of them are left over from other media. So at Matter, we look at some of them and say they are pointless—we don’t need them. The vast overhead of staff is a good example. We currently have a staff of three, and that’s quite enough, we don’t need more. We freelance things out, so our fact-checkers and copy-editors are part of a network, rather than in-house. We hand over some of

the editorial decision making, in some form, to our readers.”

By leaving some legacy media constraints behind, Web platforms like Matter allow for much faster “pen to publication” times. “If you work for a news organization, you think about this stuff all the time, like ‘oh my god, how many pages have we got left?’ or ‘what’s our readership like on Fridays?’” At *The Guardian*, Johnson would need to write with a different style and a different pace on Saturdays, for example, because the piece would be a part of a “weekend package” that was meant to be consumed over brunch in the form of a print newspaper. “But what we do [at Matter] is say, ok, we’re not in a *moment* of consumption, we’re in a *mode* of consumption,” Johnson explained. “I don’t know if you’re going to read our story today, or if you’re going to read it next week, or maybe in a month, or 3 months. But it’s still there, and it’s still as valid then as it is now.”

Matter’s conversations also show how digital publishing technologies and social media are blurring the distinctions between source, writer and reader. Today, readers get a say on science news content and give their input to journalists through social media. Journalists’ roles are also diverging. Struggling for full-time careers, many science journalists are turning to part-time or full-time positions as science public relations officers or teachers, engaging in freelance journalism or blogging on the side. “It’s crazy the number of people who are science blogging,” Hansen said. “You’ve got practicing scientists trying their best to explain what they do to the public. Do they always do it perfect? No. But at least there’s something genuine going on there. They’re not trying to create a product that they can sell; they just want to communicate what the science is. And people do want to understand it, so I think there you have the seed for something that could be quite powerful. Does it save science journalism? I don’t know, does it need to be saved?”

Zimmer finds it interesting that blogging became popular among scientists over the past decade in response to bad journalism: “Scientists would get so angry with poor presentation of science in the media, and often rightly so, and now they had a way to sort of talk back.” A good example of this is RealClimate.org, which was started by a group of climate scientists frustrated by incorrect coverage of the science in the

mainstream media. The Conversation (theconversation.com) is another example: it’s an independent source of news from the academic and research community, delivered directly to the public. “I think the fantastic thing about science is that *nothing* is definitive. Everything can be interrogated or questioned, or carefully examined,” Johnson said. “And I think the tools we have now [like blogs and Twitter] to publish and talk about things are great ways of interrogating science and making both the coverage of science and the actual practice of it much better.”

Johnson believes these technologies—blogs and social media—have more positive than negative potential. “I think being able to talk about and *to* the people involved in the chain of information is just *so amazing*,” he said. “The scientists I know who are really into communicating with people, and talking about their ideas, this is the best thing that’s ever happened to them.” But this type of direct communication is highly reliant on the communication skills of the researcher him or herself, and most researchers still lack training in the principles of communicating science with non-specialists. They also often lack training in the principles of investigative journalism. “In some ways, we are in a better place than ever because we get a lot of explanatory science journalism, which is great,” Hansen said. “What we don’t tend to get a lot of is the investigative stuff. It’s hard. It takes expertise, and relatively few people are qualified to do it.” In other words, investigative science journalism takes time and investment rarely afforded either by traditional news media models or low-budget, direct-to-consumer blogging.

Blogging is also criticized by some as “unfiltered”, in the sense that there is no editorial oversight and the content is not usually journalistic, that is, involving critical analysis, multiple viewpoints, fact checking, etc. But many in science journalism, DiChristina included, see the argument over the fuzzy line between journalists and bloggers as old news. The emphasis today is on the *quality* of the content being produced, whether on blogs or on news sites. “I don’t think it’s useful to get too obsessed with the term ‘blog’,” Zimmer said. “Because it’s not really any one thing. There’s software that lets you publish things and have comment threads. If you want to call that blogging, that’s fine, but you can format that to be just straight news reporting, if you want.”

“There’s been a second wave of thinking about blogs,” Fagin said. “The talk 5 years ago that everyone would be getting their information from scientists who are bloggers—a lot of that has really faded, because the traffic has not really been there, and the monetization is *definitely* not there.” But that’s not to say that blogs are dying, Fagin added. “Blogs are going to *augment* science news reporting and analysis, but they aren’t going to replace it. What’s important is who’s doing the storytelling on science blogs, and are they sticking to the best traditions of traditional journalism, which is verification, multiple perspectives and context.”

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Various universities in the USA, including NYU, are trying to address this challenge through workshops on communicating science to lay audiences for PhD students, postdocs and medical students. But concern over quality remains, especially for independent science blogs that pop up on WordPress, Tumblr and Blogger. “If you are a blogger for *Scientific American*, for example, even if you aren’t writing for the magazine, if you are sort of in that ‘mainstream,’ I think you immediately have a sense of responsibility,” Spear said. “You have an editor who double checks your material, you are bound by a certain code of conduct and it’s part of your contract with the organization you write for. But if you’re a blogger who just got a WordPress account and uses a cool theme, you are not bound by anything. Even if you’ve got the best of intentions, you’ve got nobody to double check your material. [...] You can just write what you damn well feel like on that particular day, and if a bunch of your friends like it and you get a bunch of likes on Facebook, you think ‘wow, I’m good!’. That doesn’t mean you’re good, that just means you got a bunch of likes.”

In response to the concern that popularity has become a substitute for credibility, there is a new trend in the world of science blogging: the growth of communities with blogging managers, editors or volunteers who can help ensure the quality of the content. At *Science Borealis*, a non-profit blogging platform from Canadian perspectives, a group of volunteers provide oversight to a network of science bloggers. While the idea is not necessarily to edit the work of the writers, the volunteer oversight promotes high-quality blogging over time while weeding out pseudoscience. “I think those are the sites that can really keep science journalism alive and growing,” Spear said.

When it comes to the business models and physical structures of science journalism

in the future, experimentation seems to be the name of the game. Blogging is probably not the final answer, but high-quality blogging networks, often overseen by community managers and editors, have great potential to augment conversations around the science content of news organizations. Not-for-profit, foundation-funded and privately supported platforms that provide longer form coverage are also on the rise, along with crowd-funded investigative science journalism. Conversely, readers are also learning how to better navigate the messy online information landscape. They’re learning to make better choices in their information diets, often by turning to trusted outlets such as the *New York Times* or *Scientific American*, or by

following credible science journalists such as Carl Zimmer, Ed Yong, Deborah Blum and others on social as well as traditional media. “I was in a much more dour mood a few years back,” Zimmer laughs. “But it seems like there are a lot of exciting developments that are not just a flash in a pan, that really seem to be going in interesting directions, and are starting to tap into big audiences. I think that’s what science journalism is going to need—to keep an audience—because if no one is reading you or listening to you, then that’s it. That’s the name of the game.”

Conflict of interest

The author declares that she has no conflict of interest.