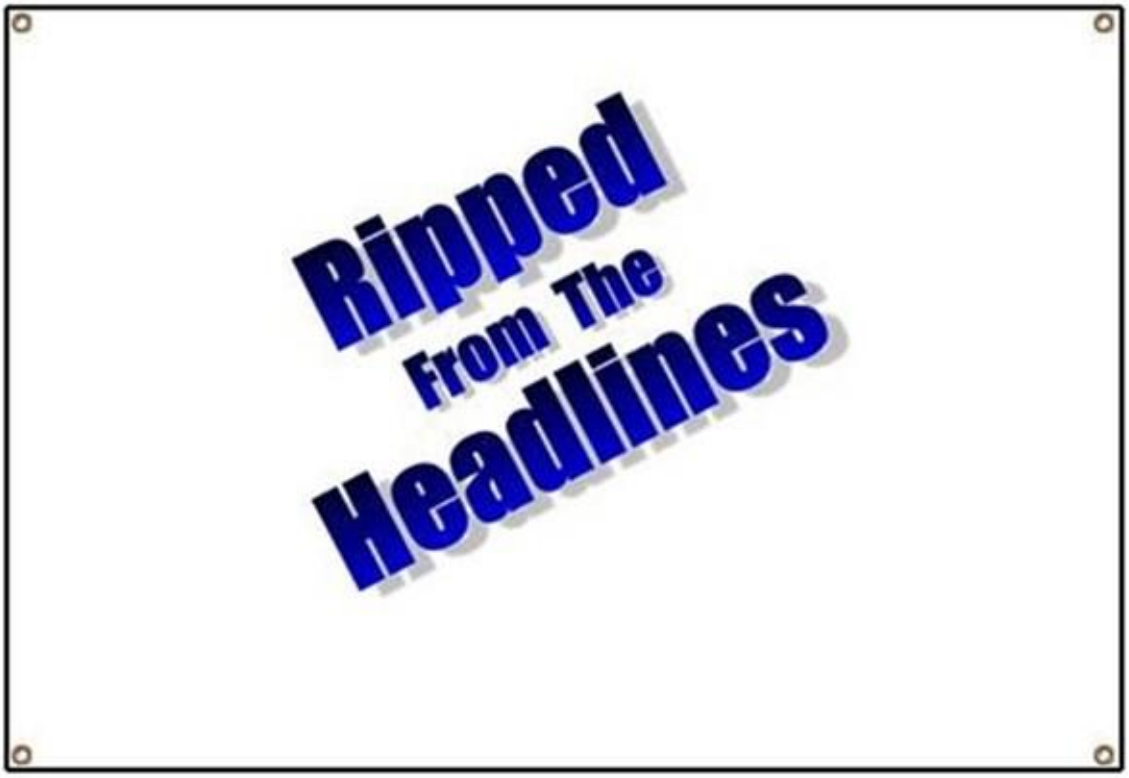
Philosophy Ripped From The Headlines!



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Compiled & Edited by *Philosophy Without Borders*

Philosophy Ripped From The Headlines! **is delivered online in (occasionally discontinuous) weekly installments, month by month.**

Its aim is to inspire critical, reflective, synoptic thinking and discussion about contemporary issues--in short, *public philosophizing* in the broadest possible, everyday sense.

Every installment contains (1) excerpts from one or more articles, or one or more complete articles, that recently appeared in online public media, (2) some follow-up thoughts for further reflection or discussion, and (3) a link or links for supplementary reading.

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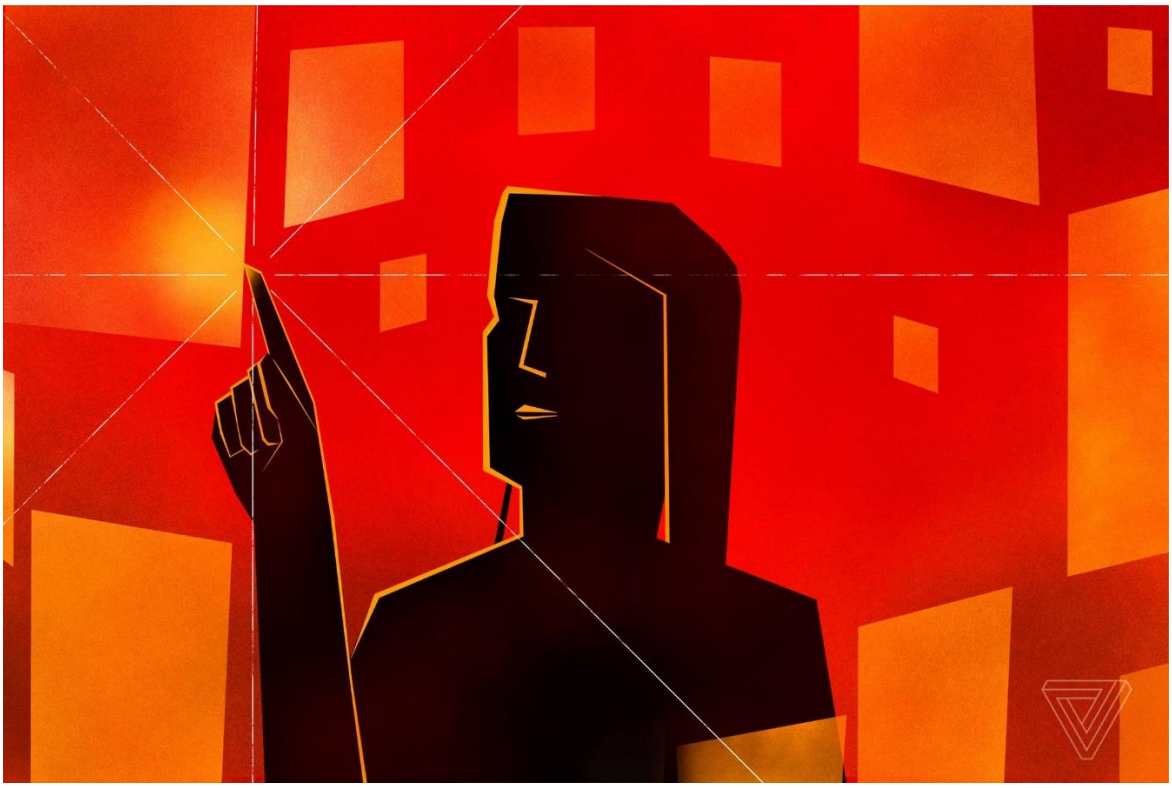
1. "Science's Pirate Queen"

By Ian Graeber-Stiehl

***The Verge*, 8 FEBRUARY 2018**

Full article available at URL = https://getpocket.com/explore/item/science-s-pirate-queen



In cramped quarters at Russia's Higher School of Economics, shared by four students and a cat, sat a server with 13 hard drives. The server hosted Sci-Hub, a website with over 64 million academic papers available for free to anybody in the world. It was the reason that, one day in June 2015, Alexandra Elbakyan, the student and programmer with a futurist streak and a love for neuroscience blogs, opened her email to a message from the world's largest publisher: "YOU HAVE BEEN SUED."

It wasn't long before an administrator at Library Genesis, another pirate repository named in the lawsuit, emailed her about the announcement. "I remember when the administrator at LibGen sent me this news and said something like 'Well, that's... that's a real problem.' There's no literal translation," Elbakyan tells me in Russian. "It's basically 'That's an ass.' But it doesn't translate perfectly into English. It's more like 'That's fucked up. We're fucked.'"

The publisher Elsevier owns over 2,500 journals covering every conceivable facet of scientific inquiry to its name, and it wasn't happy about either of the sites. Elsevier charges readers an average of $31.50 per paper for access; Sci-Hub and LibGen offered them for free. But even after receiving the "YOU HAVE BEEN SUED" email, Elbakyan was surprisingly relaxed. She went back to work. She was in Kazakhstan. The lawsuit was in America. She had more pressing matters to attend to, like filing assignments for her religious studies program; writing acerbic blog-style posts on the Russian clone of Facebook, called vKontakte; participating in various feminist groups online; and attempting to launch a sciencey-print T-shirt business.

That 2015 lawsuit would, however, place a spotlight on Elbakyan and her homegrown operation. The publicity made Sci-Hub bigger, transforming it into the largest Open Access academic resource in the world. In just six years of existence, Sci-Hub had become a juggernaut: the 64.5 million papers it hosted represented two-thirds of *all* published research, and it was available to anyone.

But as Sci-Hub grew in popularity, academic publishers grew alarmed. Sci-Hub posed a direct threat to their business model. They began to pursue pirates aggressively, putting pressure on internet service providers (ISPs) to combat piracy. They had also taken to battling advocates of Open Access, a movement that advocates for free, universal access to research papers.

Sci-Hub provided press, academics, activists, and even publishers with an excuse to talk about who owns academic research online. But that conversation — at least in English — took place largely without Elbakyan, the person who started Sci-Hub in the first place. Headlines reduced her to a female Aaron Swartz, ignoring the significant differences between the two. Now, even though Elbakyan stands at the center of an argument about how copyright is enforced on the internet, most people have no idea who she is.

"The first time I encountered the distribution of scientific articles and sharing, it was in 2009," Elbakyan says. As a student doing research at the Russian Academy of Sciences, she ran across an obstacle encountered by students the world over: paywalls. Most science journals charge money to access their articles. And the prices have only been rising.

How much? Exact estimates are hard to come by. Research by the Association of Research Libraries (ARL) suggests that the cost of libraries' subscriptions to journals only increased by 9 percent between 1990 and 2013. But as *Library Journal*'s annual survey pointed out, there was a change in ARL's data collection. That estimate, *Library Journal* said, "flies in the face of reality." *Library Journal*'s records showed that a year's subscription to a chemistry journal in the US ran, on average, for $4,773; the cheapest subscriptions were to general science journals, which only cost $1,556 per year. Those prices make these journals inaccessible to most people without institutional access — and they're increasingly difficult for institutions to finance as well. "Those who [have] been involved with purchasing serials in the last 20 years know that serial prices represent the largest inflationary factor for library budgets," the *Library Journal* report says.

Taken together, universities' subscriptions to academic journals often cost $500,000 to $2 million. Even Harvard said in 2012 that it couldn't afford journals' rising fees, citing, in particular, two publishers that had inflated their rates by 145 percent within six years. Germany's University of Konstanz dropped its subscription to Elsevier's journals in 2014, saying its prices had increased by 30 percent in five years.

The prices rise because a few top players have positioned themselves with the power to ratchet them up with impunity. Over half of all research, according to one study, is now published by the big five of academic publishing: Reed-Elsevier, Wiley-Blackwell, Springer, Taylor & Francis, and, depending on the metric, either the American Chemical Society or Sage Publishing. That's a significant change from 1973, when only 20 percent of these kinds of papers were published by the big five. And that's just for natural and medical science papers; the social sciences have it worse. In 1973, only one in 10 articles debuted in the big five's pages; now it's more than half. For some fields, such as psychology, 71 percent of all papers now go through these players.

Profits and market caps for the publishers have also swelled. Elsevier's parent comapny RELX Group, for example, boasts a nearly $35 billion market cap. It has reported a nearly 39 percent profit margin for its scientific publishing arm — which dwarfs, by comparison, the margins of tech titans such as Apple, Google, and Amazon.

If you're looking to access an article behind a paywall, the only way to get it legally is to pay, says Peter Suber, director of Harvard's Open Access Project. But there is a gray area: you can ask an author for a copy. (Most academics will oblige.) Aside from either that or finding articles published in free Open Access journals, the next best option is to find pre-publication copies of papers that authors have put in open-access repositories like Cornell's Arxiv.org.

Suber is one of the loudest voices for Open Access movement. He was one of the original architects of the 2002 Budapest Open Access Initiative statement that established the most widely used definition of Open Access: "free availability on the public internet," with the only constraint on sharing of research being authors' "control over the integrity of their work and the right to be properly acknowledged and cited." It also established the movement's mandate to make Open Access the default method of publishing within a decade.

That hasn't happened yet, but the movement has inspired people to create thousands of Open Access journals including PLOS (the Public Library of Sciences). The movement has also pushed many publishers to allow scientists to upload their research to Open Access repositories like Arxiv.org — which are currently the largest legal source of Open Access papers. The movement has been so successful that even the government has shown signs of supporting it. For instance, in 2013, the Obama administration mandated that copies of research conducted through federal agencies must be uploaded to free repositories within 12 months of publishing.

Many students like Elbakyan simply email studies' authors, or tweet the article's information with the hashtag #ICanHazPDF hoping someone will send them a copy if they're blocked by a paywall. But these methods, like scouring Arxiv, tend to be hit-or-miss. So when Elbakyan found herself facing paywall after paywall, she began to wonder why she shouldn't just jump them.

Elbakyan had been following the Open Access movement and was an ardent fan of MIT's OpenCourseWare — an initiative through which the university makes virtually all of its coursework available — since 2008. She'd also always been fascinated with neuroscience, especially the articles by the neurologist-turned-writer (and longtime head of *The Guardian's* Neurophilosophy blog) Mo Costandi. Elbakyan became convinced that untapped potential was hidden in the human brain. She particularly liked the idea of the "global brain," a neuroscience-inspired idea by futurists that an intelligent network could facilitate information storage and transfer — driving communication between people in real time, the way that neurons that fire together wire together.

"I started thinking about the idea of a brain-machine interface that can connect minds in the same way computer network does," Elbakyan says. If a human's mind could be connected to a bird's, she wondered, could we truly experience what it felt like soar?

At first, these were just philosophical musings. However, Elbakyan was compelled by how neural interfaces could enable people to share information, even across language barriers, with unprecedented speed. "Later, I expanded the idea to include not only hard interfaces that would connect people directly neuron-by-neuron, but also soft interfaces, such as speech, that we use every day to communicate." She cared less about the form than the function: she wanted a global brain. To her, paywalls began to seem like the plaques in an Alzheimer's-riddled mind, clogging up the flow of information.

Her inspirations also took a slightly more nationalistic bent. Elbakyan studied the writings of Russian neurofuturist thinkers like Vladimir Ivanovich Vernadsky. In 2011, she attempted to create a Russian-language PLOS-style Open Access journal. (She failed to find enough scientists who were interested.) Later that year, Elbakyan even applied to the Skolkovo Innovation Center, Russia's self-styled answer to Silicon Valley.

Political theory provided new growth to her evolving Open Access philosophy. Communism, a model of government-less society in which resources and opportunity are metered out with equality and impartiality, has never been successfully implemented. Nevertheless, it was a particularly seductive concept to Elbakyan. The collective ideals of communism entwined for her

with the ideals of the scientific method. After all, science depends on shared data. History's greatest scientific discoveries have all been made and shared, as scientists often say, from atop the shoulders of giants: their scientific predecessors who shared their research. To Elbakyan, science thrives only when scientists *shout* their discoveries to everyone.

According to Elbakyan, communism and science share a common mission, which she refers to as "scientific communism." It's a concept she came to borrow from the 20th century American sociologist Robert Merton, who founded the sociology of science, a study of science as a social practice. (Merton coined influential terms such as "self-fulfilling prophecy," "role model," and "unintended consequences.") Most influential to Elbakyan were Merton's "norms," which were what he considered to be the defining characteristics of science: universalism, disinterestedness, organized skepticism, and, of course, communism. (Throughout our interview, she's still quick to rattle off quotes from Merton, declaring, "The communism of the scientific ethos is incompatible with the definition of technology as 'private property' in a capitalistic economy.")

Elbakyan's scientific communism mirrors the Western association between democracy and information openness. (Take the commonly used American expression "the democratization of… ") Her intellectual convictions informed the growing vehemence with which Elbakyan insisted that absolutely unfettered access was the only acceptable level of access the public should have to discoveries. Ultimately, she concluded that in an age where scientists can publish their research "directly on the internet," or through paywall-free Open Access journals, traditional publishers will inevitably fade into obsolescence.

To Open Access activists like Elbakyan and Suber, since most research is publicly funded, paywall journals have essentially made most science a twice-paid product, bought first by taxpayers and secondly by scientists.

On the whole, scientific publishing has become a market increasingly characterized by consolidation, soaring subscription fees, and rising profit margins. As a result, plenty of scientists, students, and journalists alike have come to see an empire of academic piracy as a necessity, raising the question: what value do publishers add to any given paper?

Richard Van Noorden probed this very question in a 2013 article in *Nature* that looked at the meteoric rise of Open Access journals. These journals had an unassuming start in the late 1980s and '90s with a handful of obscure digital publications. Many of these were the result of scientists, entrepreneurs, and editors from paywall publications who were inspired by the Open Access movement and struck out to start their own publications. Within just a few decades, these journals have come to account for 28 percent of all published research that's ever been issued a Digital Object Identifier — essentially a type of URL for research. As the article pointed out, many Open Access publishers charge scientists fees — often anywhere from a few hundred dollars up to around two thousand — for processing their articles, whether they're accepted or not.

Standard publishers, by contrast, generally charge much less if they require processing fees at all. In return, they find peer reviewers, check for plagiarism, edit, typeset, commonly add graphics,

convert files into standard formats such as XML, and add metadata. They distribute print and digital copies of research. Their press departments, especially for more prestigious journals, are well-oiled machines. They churn out perspicuous press releases and help journalists get in touch with experts, enforcing embargo periods where media outlets can review research and formulate their coverage before it goes live — which creates incentives for publications like *The Verge* to cover more of their studies.

Many publishers also do original journalism and commentary, thanks to the work of large, costly full-time staffs of editors, graphic designers, and technical experts. "But not every publisher ticks all the boxes on this list, puts in the same effort or hires costly professional staff," wrote Van Noorden in the *Nature* article. "For example, most of PLoS ONE's editors are working scientists, and the journal does not perform functions such as copy-editing." Publishing powerhouses like *Proceedings of the National Academy of Sciences* have estimated its internal cost per-article to be around $3,700. *Nature*, meanwhile, says that each article sets it back around $30,000 to $40,000 — an unreasonable amount to expect scientists to pay if they were to go Open Access.

Charging a fee isn't the only business model for Open Access journals, Suber says: 70 percent of peer-review Open Access models don't do it. Moreover, thanks in large part to pressure by Open Access activists like Suber, many journals allow scientists to deposit a copy of their work in repositories like Arxiv. Elbakyan, on the other hand, wants Open Access fees covered up front in research grants.

This question of what value publishers add was front and center in coverage on Elsevier and Elbakyan's case. *The New York Times* asked, "Should All Research Papers Be Free?" When *Science Magazine* worked with Elbakyan to map Sci-Hub's user statistics, it discovered that a quarter of Sci-Hub downloads were from the 34 richest countries on Earth. Elbakyan argues Sci-Hub is a tool of necessity, and its massive usership in poor countries seems to strengthen her case. But the 25 percent of users from wealthy countries suggests Sci-Hub is a tool of convenience, says James Milne, a spokesman for the Coalition for Responsible Sharing, a consortium that represents the interests of big publishers. (When I contacted Elsevier for comment on this story, I was referred to Milne.) The CRS was originally formed by a coterie of five publishing giants — Elsevier, ACS, Brill, Wiley, and Wolters Kluwer — to pressure scientist social networking site Researchgate into taking down 7 million unauthorized copies of their papers.

Before Elbakyan was a pirate, she was an aspiring scientist with a knack for philosophizing and computer programming. "I started programming before even being in school," Elbakyan says. Once enrolled, she developed a program that would ultimately serve as a precursor for Sci-Hub: a script that circumvented paywalls, using MIT's subscription programs to download neuroscience books. "It wasn't working exactly the same as Sci-Hub, but it was delivering the same result: going around paywalls and downloading those books." She often shared these books with other users on a Russian biology forum she frequented, molbiol.ru, which would prove to lay the groundwork for Sci-Hub's debut.

“Sci-Hub started as an automation for what I was already doing manually,” Elbakyan says. It grew organically from her desire to let people download papers “at the click of a button.” Users loved it. Sci-Hub’s use proliferated across the forum immediately — though it took longer for it to outgrow the forum.

Russia’s weak intellectual property protection had long made it one of the largest piracy hubs among major economies. This was an advantage for Elbakyan in creating Sci-Hub, but she soon found herself watching Russia and Kazakhstan’s dialogue on piracy shift. For years, the focus had been entertainment, but now it was rapidly pivoting toward academic piracy. New anti-piracy laws, which targeted what Elbakyan saw as essential information sharing, hit home for her: in Kazakhstan, illicit file-sharing had just become punishable by up to five years in prison. She felt that the only responsible choice was to join the fray herself.

When Elbakyan started Sci-Hub in 2011, “it was a side project,” she says. She operated it without a repository for downloaded articles. With every request for a paper, a new copy was downloaded through a university’s subscription. It would automatically be deleted six hours later. If, for some reason, a person couldn’t access a paper through one university’s servers, they could switch and download them through another’s.

In 2012, she struck a partnership with LibGen, which had only archived books until then. LibGen asked Elbakyan to upload the articles Sci-Hub was downloading. Then, in 2013, when Sci-Hub’s popularity began to explode in China, she started using LibGen as an offsite repository. Instead of downloading and deleting new copies of papers or buying expensive hard drives, she retooled Sci-Hub to check if LibGen had a copy of a user’s requested paper first. If so, she pulled it from its archive.

That worked well until the domain LibGen.org, went down, deleting 40,000 papers Elbakyan had collected, probably because one of its administrators died of cancer. “One of my friends suggested to start actively collecting donations on Sci-Hub,” she says. “I started a crowdfunding campaign on Sci-Hub to buy additional drives, and soon had my own copy of the database collected by LibGen, around 21 million papers. Around 1 million of these papers [were] uploaded from Sci-Hub. The other[s], as I was told, came from databases that were downloaded on the darknet.” From then on, LibGen’s database would simply be her backup.

Elbakyan is reluctant to disclose much about how she secured access to so many papers, but she tells me that most of it came from exploiting libraries and universities’ subscriptions, saying that she “gained access” to “around 400 universities.”

It’s likely that many of the credentials Elbakyan secured came from leaked login information and lapses in universities’ security. One official at Marquette University, alleges to have seen evidence of Sci-Hub phishing for credentials. Elbakyan vociferously denies this and has previously said that many academics have even offered their login information. That could explain how Sci-Hub downloads some papers “directly from publishers,” as she has previously claimed.

It wasn't until 2013 that Elbakyan faced her first major obstacle. That was when Elsevier sent a notice to PayPal, where she'd collected donations. At the time, according to testimony the publisher later gave in its lawsuit, Elsevier was aware that Sci-Hub had paid some students for access to their university credentials. And several PayPal payments had been sent to Elbakyan for buying a proxy server that would allow Sci-Hub to authenticate itself as a student. After the publisher's notice, PayPal deactivated her account.

When Elsevier's first shot across Elbakyan's bow splashed down, the publisher already had gotten serious about pressuring internet service providers and payment services to enforce privacy. But it wasn't the first time the publisher had pulled these strong-arm tactics. In fact, Elsevier was leading the way among academic publishers.

In 2008, Elsevier shut down an international piracy operation wherein a Vietnamese entrepreneur was selling digital copies of journals to academics. The publisher, both on its own, and through at least one industry group, the American Association of Publishers, pushed Congress for laws that that would have made it easier for publishers to more easily coerce ISPs, search engines, and DNS services to block access to a site — or force advertisers and payment services to drop their support for copyright violators.

From publishers' perspective, it only made sense. Increasing their own power to enforce copyright claims was protecting their intellectual property. And though the bills sparked intense backlash for many companies that supported them, individual academic publishers like Elsevier were overlooked.

That same year, the AAP and Elsevier also supported and lobbied in favor of a bill that would have prevented the government from requiring agencies to make research published through a journal Open Access at any point. That would have effectively killed the NIH's 2005 mandate that all research funded by the agency have a copy submitted to an Open Access repository within 12 months.

Later that year, the publisher's rising prices and support for restrictive legislation galvanized nearly 17,000 scientists to pledge against publishing in its journals. Facing backlash, Elsevier reversed its position. Despite its meteoric rise, the boycott ultimately faded with little concrete effect on the publishing giant.

Elsevier's efforts weren't limited to lobbying for more-restrictive laws, either. Months before targeting Elbakyan, Elsevier helped 17 other publishers shut down the pirate academic repository Library.nu. Between 2012 and 2013, Elsevier and the AAP also opposed and lobbied against three bills — the Federal Research Public Access Act, Public Access to Public Science Act, and Fair Access to Science and Technology Research — all of which proposed making it mandatory that copies of papers from federally funded research be deposited in an Open Access repository after some period.

In 2015, Elsevier sued the piracy site AvaxHome for $37.5 million. Then, the UK-based Publishing Association, of which Elsevier was a member, and the AAP, where Elsevier was

joined by closely associated publisher, the *American Chemical Society* (*ACS*), also successfully filed an injunction against a slew of ebook pirates — including AvaxHome, LibGen, Ebookee, Freebookspot, Freshwap, Bookfi, and Bookre — mandating that ISPs block customers' access to them. Later, it also attempted to force Cloudflare, an internet security service, to turn over logs that would identify the operators of LibGen and Bookfi.

Elsevier hadn't gotten the laws it wanted, ones that would have allowed it to pressure ISPs, payment services, and other internet intermediaries to block sites accused of piracy. So instead, it steadily set court precedents that did the same thing.

Elsevier doesn't oppose Open Access, says the Coalition for Responsible Sharing's Milne. "I can say with confidence that all the members of the Coalition (Elsevier included) embrace open access," Milne says. (He refused to answer any line of questioning that focused too heavily on any one publisher's actions.) Every one of the members of the coalition has their own Open Access journals. And they all also allow scientists to upload a copy of preprint, non-peer-reviewed papers to Open Access archives.

The actions of the publishers in the coalition have simply shown an opposition to illegal and unauthorized sharing, Milne says. Before Elsevier and ACS sued Researchgate, they tried for two years to convince the site to adopt their "Voluntary Principles on Article Sharing," which would allow scientists to share articles — though only between others in their research groups, and provided that articles' metadata wasn't changed, preventing publishers from collecting accurate data on articles' sharing statistics. Before suing Sci-Hub, Elsevier attempted to stop Elbakyan technically. The publishers feel they've been patient in enforcing copyright claims, particularly considering that, as Milne tells me, their sales teams have heard "individual institutions and consortiums," which he is not at liberty to name, name-drop Researchgate and pirate sites like Sci-Hub to get leverage in price negotiations.

Sci-Hub's burgeoning reach and reputation painted a target on Elbakyan's back. Nonetheless, by the time Elsevier took aim, Elbakyan was already a woman on a mission. Sci-Hub was about to become more to Elbakyan than a "side project."

"With LibGen, I saw that it is possible to accumulate 10 million scientific articles," she says. After that, she figured "[why] not download all the scientific articles that are currently listed in cross-reference database?" With PayPal now closed to her, she simply turned to bitcoin donations to keep feeding Sci-Hub's growth.

Elbakyan had been pursuing a master's program on public administration (which, she tells me, would've allowed her to make the "upgrade" to her living conditions she'd long been jonesing for) at Russia's National Research University. She'd hoped it would let her influence internet information-sharing legislation. But in 2014, Elbakyan left, disappointed.

She switched to a master's program in religious studies, where her thesis led her to research how ancient societies treated information distribution. Both the revelations about the ancient societies

and their attitudes toward ”information openness,” and the “feeling that [public administration] wasn’t quite the direction that I wanted to go” led her to double down on Sci-Hub.

Elbakyan created several more backup copies of Sci-Hub’s database. She rewrote Sci-Hub’s code, starting from square one, so that the service could download papers automatically. Now, once users pointed Sci-Hub toward an article, the site would check every university proxy server until it found one through which it could download the paper, and would download it automatically. They didn’t have to manually browse the publisher’s website through Sci-Hub to find the articles anymore.

Elbakyan had defied Elsevier. Her former hobby had become her primary focus. Nothing would make her waiver from making Sci-Hub a titan of Open Access.

Until, that is, the Kremlin unintentionally accomplished what Elsevier couldn’t: it got Sci-Hub shut down — at least in Russia. After an isolationist policy enacted by the Kremlin sparked intense bickering between scientists and Elbakyan, she pulled the plug herself.

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In May 2015, as part of a sweeping effort to insulate Russia from foreign influence, the Kremlin labeled Russia’s only private funder and popularizer of scientific research, the Dynasty Foundation, a “foreign agent.” Unlike much of the scientific community, Elbakyan was happy about change. However, her reaction would spark what she saw as cyberbullying from her opponents, prompting her to shut down Sci-Hub in Russia.

About three years before the Dynasty incident, the Kremlin adopted a law that required any organization with foreign funding not strictly involved with “science, culture, art, healthcare, charity,” and a laundry list of other activities, to register as a “foreign agent.” This barred those organizations from any further political activity, and raised a red flag for any associated groups. Charities, NGOs, and many social scientists decried the law, refusing to register. They argued that “political activity” was vaguely described, and that the law would cripple vital international collaboration. So, in 2014, the Kremlin amended the law so organizations could be labeled involuntarily. By July of last year, 88 organizations had become “foreign agents,” and the law had sparked protests from human rights groups calling it a crackdown on freedom of expression and LGBTQ rights.

Dynasty was founded in 2002 by Dmitry Zimin, a beloved philanthropic oligarch whose work had even won him an award from the government “for the Protection of the Russian Science” just weeks earlier. By American standards, Dynasty wasn’t that deep-pocketed. In 2015, its anticipated budget for research funding amounted to just $7.6 million USD. And yet, in Russia, it had no peer as a private supporter of science.

However, Dynasty had always been heavily involved in education: funding research, supporting high school science programs, and training science teachers, among other things. In order to continue the same line of work, the fund would now somehow have to tiptoe through its

involvement in the education system without doing anything that the Kremlin could construe as political activity.

Through Dynasty, Zimin supported another one of his organizations, the Liberal Mission Foundation (LMF). It was effectively a think tank that assisted education initiatives that taught modern political science from a liberal perspective in Russian schools — including Elbakyan's. This is ostensibly what qualified as "political activity." And though Zimin was a Russian national, he kept the money with which he supported Dynasty in foreign banks — making it fair game to be considered foreign funding. (In an interview with *The New Yorker*, Zimin said, "The Russian government also keeps its money abroad," likely referencing the fact that the Kremlin holds billions in US bonds.) Together, Zimin's "foreign" money and Dynasty's relation to the LMF provided the excuse for the "foreign agent" label.

Zimin was likely interesting for other reasons, though. Not only did he attend 2012 anti-Putin protests in Moscow, he also supported a free press. In 2014, when Zimin's cable company, Beeline, was forced by the government to drop Dozhd, the country's only major liberal, independent TV news station, Zimin said, "I think that everyone understands that this is not Beeline's decision." Afterward, he went on to bankroll a number of independent news outlets.

The government never cited these incidents as part of its reason for labeling Dynasty and the LMF as "foreign agents," though Zimin's past ventures do raise some suspicion about the Kremlin's motives. Nevertheless, Zimin decided to shutter Dynasty, to get the LMF taken off the "foreign agent" list.

Many scientists protested, but Elbakyan didn't understand the outrage. As far as she was concerned, Dynasty — particularly through its funding of the LMF — had spread "propaganda against Putin and the Russian authorities." She describes Zimin's work through Dynasty, and the organization itself, as "anti-communist," though she's vague about how. Elbakyan says the foundation and Sci-Hub are "ideologically opposed," and contends that Dynasty is somehow Sci-Hub's capitalistic foil.

"I knew about this fund firsthand. It was involved in the Higher School of Economics where I was studying," Elbakyan says. So, she began writing posts presenting instances of Dynasty supporting liberal-leaning groups. She asserts that she didn't want to "[argue] any kind of side." But the posts read with surprising acrimony for someone ostensibly attempting to be objective. She dubbed Dynasty's supporters "the Brigades of the 'Dynasty.'" She also re-shared negative articles about Dynasty that were written by state-controlled media outlets, and even shared Photoshopped pictures doctored to cast Zimin in a blatantly suspicious light.

Shortly afterward, something strange happened. Former members of Sci-Hub's vKontakte group began saying that Elbakyan, a champion of Open Access to information, had blocked them.

"They just started launching just really personal and low bar attacks on me personally, calling me names, spreading false information about me, calling me crazy, etc." So she threw them out.

Many of the former members of Sci-Hub's vKontakte group say that they simply got booted for supporting Dynasty. One scientist, Dmitry Perekalin of Nesmeyanov Institute, said that Elbakyan asked her group to vote on which was better for Russian science, Sci-Hub or Dynasty. "I wrote that it was a false dilemma and was immediately banned," Perekalin said in a vKontakte post. Ultimately, Elbakyan shut down Sci-Hub in Russia for several days (though many people could still access it through Virtual Private Networks).

Shortly after the Dynasty controversy at home, Elbakyan discovered that Elsevier was suing her and LibGen abroad.

"I did not believe that it's possible to win against such a well-funded, rich, and influential company," says Elbakyan. Rather than fight the case, she'd just keep an eye on it from afar. Money aside, "I would have had to provide certain documents that potentially could have exposed me or my physical location."

Elsevier's lawsuit was a *civil* case, for which extraditing someone to the US from abroad to be tried is generally against the law. Still, Elbakyan worried about being extradited. "I do know about stories where hackers that left Russia or Ukraine for Europe or the United States were unexpectedly arrested." Although, the main reference she cites is the arrest of Dmitry Zubaka, who had *criminal* charges against him for a cyberattack against Amazon. Nonetheless, since her last visit in 2010 to speak at Harvard, she's had no intention of returning to the US.

Court transcripts reveal that Elsevier had been playing cat-and-mouse with Elbakyan, working with universities to block her access to the university proxies Sci-Hub used to access their journals. Elsevier's technicians were able to identify many source IP addresses associated with university computing systems that looked suspicious. They alerted institutions about these breaches, so that the schools could block these proxies' credentials. However, Elbakyan had penetrated too many universities, and not every school had the technical expertise to keep up.

Elsevier steadily shut down student accounts whose credentials Elbakyan was using to access Elsevier's database, Science Direct. By doing this, it had "vastly reduced" her access to its articles. On Sci-Hub's Twitter page, Elbakyan even complained about this, saying that "[due] to the huge amount of accounts that were closed recently we were forced to introduce limits on the maximum number of users, especially foreigners." She had to prioritize the access of "former USSR countries," says Elbakyan. "Access from China and Iran was blocked for some time because Sci-Hub couldn't serve as many requests as were coming from these countries. She also made Sci-Hub inaccessible to Americans (except those using VPNs) — in part because of the number of download requests, but also because she wanted to avoid becoming a target for lawsuits.

Then, Elbakyan switched her strategy. As Elsevier's technicians testified, instead of using university proxy servers to access Elsevier's repository directly, Sci-Hub started using them just to obtain an authorization token. Then Sci-Hub could use the token to connect to the repository from a different IP address — no longer leaving an easy breadcrumb trail of the same handful of IP address being consistently used to access and download an outrageous number of papers. By

the time the publisher had gone to trial, it still hadn't figured out any effective workaround to this technique. But, Elsevier had found a different pressure point for enforcing piracy that would establish a precedent for another publisher to get something of a chokehold on Sci-Hub.

Elsevier was awarded $15 million in June. Thanks to an injunction included in the suit, Elbakyan lost the domain Sci-Hub.org as well as Sci-Hub's Twitter account — but, according to Elbakyan, not before the media coverage boosted Sci-Hub's usership by a factor of 10.

"I *was* disappointed in the results of the lawsuit," she says. "[That] public opinion and the position of modern society did not correspond with the justice's decision" was a blow. "As far as the amount is concerned," Elbakyan says that she couldn't pay $15 million even if she wanted, as she is getting "only few thousand a month" in donations. She may be undercounting. One 2017 *PeerJ* study estimated that Sci-Hub owned $268,000 in unspent bitcoin as of August 2017. (Though Elbakyan has publicly disagreed with that estimate, she hasn't said how much she owns in bitcoin. She claims the exact amount is confidential.) Nonetheless, since Elbakyan lives outside the US, she can't be compelled to pay. "I was actually flattered that my project was evaluated so highly," she says.

A week later, Elbakyan discovered she was being sued again, this time by the scientific society and publisher ACS. The suit was a long time coming. ACS publications rank among the most-covered by Sci-Hub. To date, Sci-Hub holds copies of 98.8 percent of all of ACS's research. Until November, when ACS was awarded $4.8 million, she admits that she didn't follow the case.

But ACS proved more formidable than Elsevier — winning not only the suit, but an injunction demanding that "any Internet search engines, web hosting and Internet service providers, domain name registrars, and domain name registries," stop doing anything to make Sci-Hub's operation — and piracy — possible.

Legal and tech activists like the Electronic Frontier Foundation (EFF) immediately decried the injunction. It went too far, the EFF said, setting a precedent eerily similar to previously proposed legislation would've worked: ACS theoretically could strong-arm any service that could be seen as aiding Sci-Hub. Forcing internet intermediaries to enforce copyright claims by shutting down accused sites wholesale makes it possible for copyright holders to abuse claims of infringement, says Mitch Stoltz, a senior staff attorney at the EFF. If a website can "disappear on command" without any oversight, there is no incentive to encourage copyright holders to be judicious. Even if a website simply advertises or links to another infringing site, or unintentionally has a few unauthorized reproductions of copyrighted works, not only *could* a copyright holder black out the site entirely, it would be relatively easy.

The Computer and Communications Industry Association (CCIA), a tech nonprofit with members such as Google, Intuit, Uber, and Microsoft, even filed an amicus brief against ACS's injunction — just as it did when Elsevier, in its case, initially attempted to get a similar injunction — urging the court to drop it.

ACS's injunction wasn't the first such web-blocking order — and though ACS said that it wouldn't pursue ISPs or search engines not in "active participation" with Sci-Hub, the case is one of several that are increasingly making ISPs the pressure points of enforcing copyright. The list of governments that have blocked the site PirateBay by pressuring ISPs into denying access to the site has its own Wikipedia page. The aforementioned AAP and UK Publishers Association case against several ebook pirates also pressured ISPs into blocking access to those sites. Earlier this year, a coalition of Hollywood organizations forced Australian ISPs to block dozens of piracy sites.

Last year in a landmark American case, *The Washington Post* called "The Copyright Case that Should Worry all Internet Providers," a court determined that the ISP Cox (a former head of its Abuse Group, even went so far as to say in one email "f the dmca!!!") had flagrantly disregarded its responsibility to make *some* effort to enforce piracy. Thus, it didn't qualify for the Digital Millennium Copyright Act's so-called "safe harbor" protection, which grants a measure of legal immunity to ISPs that make adequate efforts to curb piracy. Without that protection, Cox lost a lawsuit to the music rights group BMG, which had hired a third-party organization to levy fees from Cox customers found to be accessing accused piracy sites.

After the ACS ruling, a few Sci-Hub domains (.ac, .io, and .cc) stopped working, says Elbakyan. In response, she used Twitter to tell users how to change their settings to get around the blocks. "It's useful to know how to go around domain blocking," she says. However, since then, she's lost Sci-Hub's. bz domain — announcing on vKontakte that "the capitalists have started blocking Sci-Hub domains, so the site may not be accessible at the regular addresses."

"I do not endorse illegal means for providing Open Access," says Harvard's Peter Suber. "For most of Sci-Hub's existence, I went out of my way to dissociate myself from it because it gave Open Access a bad name." However, Suber says, Sci-Hub isn't going anywhere. Elbakyan agrees. She has spare domains. She's backed up her repository of articles. According to her, even if ACS pressures search engines to black out search results, it won't matter: only 25 percent of Sci-Hub referrals come via search engines anyway.

Sci-Hub is often called the Pirate Bay of science; the Pirate Bay itself was raided twice before it finally succumbed. "If nothing happens to me personally, then naturally I will try to continue Sci-Hub project myself," Elbakyan says. If something were to happen, while her network of journal and institutional subscriptions might be lost, "the main resource of the project, being the scientific articles, they are already published on the internet."

Elbakyan faces an uphill battle. ACS has yet to show what it defines as "active participation." If Sci-Hub's Twitter page were to get taken down again, it would hobble the word-of-mouth network perpetuating Sci-Hub and ACS's current domain-name whack-a-mole.

As copyright holders continue establishing even more precedents of compelling ISPs to enforce copyright disputes, other publishers may well follow suit. The Trump administration has expanded ISPs' ability to surveil customers. Net neutrality, which prevented ISPs from biasing speed, connectivity, and access to some sites over others, has been revoked as well, which means

ISPs may get much more discretion in how they enforce piracy. These policy changes place Sci-Hub on a more tenuous footing in the US. But if America's access were further restricted, it would be a blow to the site, and to many of the "capitalists" that use it.

Despite this, Elbakyan (and Suber) plan to continue with business as usual. Suber will keep pushing for the expansion of Open Access journals and repositories despite publishers' lobbying. Elbakyan plans to handwave away any more lawsuits and play whatever game of cat-and-mouse she must.

As for the publishers, it seems their attention may be shifting to scientists themselves.

Since 2015, many publishers, including ACS and Elsevier, have pushed their STM voluntary principles for article sharing: a series of rules for researchers and networking sites for scientists on how they can share their research. More recently, at least nine of the largest publishers are actively promoting howcanishareit.com as the go-to reference for scientists looking to learn about publishers' rules on how they can share their research.

At first glance, these initiatives seem like pushes for increasing the accessibility of research. Upon closer examination, a number of holes in publishers' advocacy for access become evident: the voluntary principles focus chiefly on giving researchers guidelines on sharing papers only within small collaborative research groups, not the larger public.

Howcanishareit.com offers advice on how scientists can share their research, but buries mention of Open Access journals in links to academic editorials. Similarly, any mention that scientists are allowed to upload preprints to repositories are sequestered in links to individual publishers' contracts. Several for-profit repositories and Scholarly Collaboration Networks (SCNs) are advertised, but major nonprofit Open Access repositories like *PeerJ*, Arxiv, and bioRxiv are conspicuously absent. Overall, the site reads like an attempt to "educate" scientists away from more traditional Open Access infrastructure, and, if not to constrain their sharing, then to redirect it toward for-profit platforms.

Legal Open Access activists like Suber have disagreed with this limited interpretation of Open Access. "The benefits of OA come from sharing with the public, or with everyone who might want to read your research, cite it, apply it, or build on it," not just SCNs, he says.

These campaigns could erode the base of the Legal Open Access movement: scientists' awareness of their options for sharing research. Elbakyan, on the other hand, would be left unaffected. The legal campaigns against Sci-Hub have — through the Streisand effect — made the site more well-known than most mainstay repositories, and Elbakyan more famous than legal Open Access champions like Suber. The threat posed by ACS's injunction against Sci-Hub has increased support for the site from web activists organizations such as the EFF, which considesr the site "a symptom of a serious problem: people who can't afford expensive journal subscriptions, and who don't have institutional access to academic databases, are unable to use cutting-edge scientific research."

The effort may backfire. It does nothing to address disappointment scientists feel about how paywalls hide their work. Meanwhile, Sci-Hub has been making waves that might carry it further to a wider swath of both the public and the scientific community. And though Elbakyan might be sailing in dangerous waters, what's to stop idealistic scientists who are frustrated with the big publishers from handing over their login credentials to Sci-Hub's pirate queen?

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2. Some Follow-Up Thoughts For Further Reflection and Discussion:

Is the following argument sound? If so, why? If not, why not?

1. By *truly open access*, we mean *the universal free sharing of intellectual, artistic, socially beneficial, and/or politically significant content of any kind, together with the requirement or request that users explicitly acknowledge the original creator(s) of the content*.
2. Currently, and worldwide, most intellectual, artistic, socially beneficial, and/or politically significant content is protected by paywalls, highly restrictive copyright-and-use provisions, front-end payments, or processing charges, whose primary function is to make (often very large) profits for the individuals who created this content, the original publishers of the content, and/or the social institutions that control access to it or its dissemination. This includes many organizations that, in an intentionally very misleading way, *call themselves* "open access."
3. Nevertheless all such content belongs fundamentally to *humanity*—the cosmopolitan community of all human persons—in order to help them satisfy their true human needs; hence all such content should be truly open access.
4. Therefore, so-called "piracy" whose basic aim is to make any or all such content truly open access, *is fully morally, socially, and politically justified*, even if it circumvents paywalls, front end payments, and processing fees, or violates copyright-and-use laws.

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3. One Link For Supplementary Reading: Open Access

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