



Science Writing: The Basics

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Credits

This is a guide from the Association of British Science Writers (ABSW). This version (version 1) is available online at absw.org.uk. An eBook and full PDF of this document will be available in July 2015.

Some of this guide is based on a book chapter written by Helen Pearson for Cold Spring Harbor Press 'An introduction to science journalism for scientists seeking alternative careers'.

The guide also draws on an earlier version of this guide, '*So You Want to be a Science Writer?*', written by Natasha Loder in 2002. It also draws on the Council for the Advancement of Science Writing: A guide to careers in science writing.

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What is science writing?

SCIENCE JOURNALISTS AND WRITERS cover some of the most complex, exciting and important issues of our day, ranging from contentious developments in climate change, to the discovery of planets in remote solar systems, to arcane advances in quantum physics and genetics. They use words, sounds, images, and graphics to create compelling stories about science that appear in newspapers, magazines, online, and on the radio, TV, and on the web in podcasts and video clips. Science journalists write about recent research discoveries; they also provide analysis, context, and perspective by exploring the social, ethical, and political implications of scientific advances and the scientific process.

Science writing is a major route by which sometimes-complex scientific issues are communicated to a broad audience. Journalists cover issues in which science impacts on society and policy, such as climate change, energy, pollution, genetically modified crops, medicine, nuclear proliferation, and natural disasters. Journalists also hold scientists and the scientific process up to scrutiny. They examine questionable statistics or overinflated claims; they investigate scientific misconduct, conflicts of interest, and ethical breaches. They are often cool, dispassionate critics of science as much as they are champions of science.

For the audience, all this hopefully makes for enlightening, stimulating, informative, influential and entertaining articles and programs. For the journalist, it makes for a fascinating, constantly changing, and highly rewarding profession. It combines the creativity of writing and media with the intellectual fascination of the scientific field. It is very satisfying to have your story read or watched by perhaps tens or hundreds of thousands of people, and even — at its widest reach — have an influence on society at large. It is a competitive field, but talented people can find unique and highly rewarding careers in science journalism.

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That said, the many changes in media brought by the Internet are having their effect on opportunities for science writers. These still exist, but new entrants into the profession must be prepared to cast their net wide, and to seek their opportunities in new venues. Much of the kind of science writing and investigative journalism that used to be funded by commercial publishers now takes place within NGOs seeking to establish an evidence base for their work; academic groups that used to shun anything that smacked of popular writing now use science writers to communicate their work and its value to both public and funders. At the same time, science writers have never had a better chance to engage in training to widen the scope of what they can cover: online courses in all manner of science topics from basic physics to advanced artificial intelligence offered by premier institutions and academics are openly accessible, often for free. Check out the offerings of organisations such as Coursera, Udacity, and EdX, as well as Britain's own longstanding Open University.

This guide is aimed at those interested in learning more about careers in the British science media. This includes writing, journalism, and broadcasting and spans science, technology, medicine, and the environment. This is part of a range of career resources offered by the Association for British Science Writers (ABSW), the professional body representing science writers and journalists working across a range of media in the UK.

What do science writers do?

THERE IS A WIDE RANGE OF CAREERS involving science writing, journalism, and communication.

Science **journalists or reporters** typically work for newspapers, magazines, TV and radio stations, podcasts, news websites, blogs, and other media outlets. A typical science journalist will scan many sources of potential news, identify possible stories, ‘report’ them — meaning research the subject through interviews and other means — and then write or produce news stories.

For example, a newspaper science journalist might learn of a research paper that is about to be published showing that a new type of stem cell therapy helps animals recover after spinal cord injury. The journalist might call the scientists who did the work, as well as three other researchers in the field, including the author’s main competitor and a patient advocacy group to ask questions such as: Do the data look sound? Is the interpretation reasonable? Who funded the work? How far is it from being clinically useful? The journalist might write an article saying that the work is being embraced by patient communities but that some scientists question the rigor of the analysis and that the therapy is many years from being trialled in people. Journalists try to produce an authoritative analysis of the subject for their readers.

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Journalists write short news stories that take hours or days — and longer features, which can take several days, weeks, or months. (Science **book authors** may spend many months, and often years, researching a topic in far greater depth.) Many journalists have a specialty, or ‘beat’, such as biological or physical sciences. **Editors** oversee the process: they typically commission stories from reporters. They might commission stories they have identified, or ones that reporters have ‘pitched’ to them. Editing a written story can involve anything from tweaking a few words to re-writing most of the piece. **Sub-editors** check stories for accuracy, grammar and clarity, after editing and before publication. Broadcast news reporters tell similar stories using scripts, audio and video. Programme makers interested in longer formats compete for slots on TV and radio networks in commissioning rounds. If they win the commission, they get the money to make and broadcast their ‘pitch’.

Staff reporters are typically employed full time by a media organisation. These positions provide a steady wage and benefits and can be relatively secure (depending on the financial health of the employer, of course). **Freelancers**, by contrast, run their own business, writing or producing content for many outlets. Freelancers have more autonomy to pursue stories that interest them and to manage their own time, but they often have less financial security and may have to work harder to get a commission from an editor. There is a thriving community of freelance science journalists and writers in the UK and abroad.

A second broad category of science writers and communicators works for universities, research institutes, museums, government agencies, charities and other organisations with an interest in science. These writers typically produce media content about the science and scientists being supported by their organisation. For example, let’s say the spinal cord therapy work was done by researchers at Alpha University. A writer in the university’s communications office might produce an

article about the work for the institution's website as well as a press release to alert the media. The aim is to increase the university's profile and communicate its findings widely. People in this group sometimes call themselves **science writers, science communicators, science publicists, or public information officers (PIOs)**. These positions can have the advantage of being secure and relatively well-paid.

The boundaries between different roles in science writing and journalism are blurred and people move from one to another. A freelance writer might run their own blog, Tweet avidly, write for newspapers and magazines, and also pen books. A broadcast journalist might record a story for TV, and then produce a written version to accompany it on the web. When considering a story, editors increasingly decide whether it makes most sense to cover it with written news, a blog, an interactive graphic, using video, audio or a combination of these. All this is leading to a demand for 'multimedia' journalists who are comfortable producing content using text, graphics, audio and video — although most journalists end up specialising.

The good, bad and ugly of working in science journalism

SCIENCE JOURNALISM IS NEVER DULL, because journalists move onto new stories quickly and are always learning. It's exciting to be writing about the frontiers of research and to see the big questions facing a field. It can also be very satisfying to work hard on a story and know that many people will read or watch it, and perhaps be influenced by it or respond to it. Many journalists, presenters, and book authors build name-recognition and a reputation amongst their readers; some, such as Ben Goldacre, achieve more widespread prominence.

On the downside, journalism can be stressful. Journalists work to constant, unmovable deadlines. They may have as little as an hour to write a story. They have to quickly get to grips with complex subjects about which they may know very little, and translate those into more accessible language.

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Many journalists also complain of increasing workloads. Journalists who were once dedicated to print, or radio or TV are now asked to produce content for online news sites, podcasts, blogs, and other outlets. [A 2009 report on the state of science journalists in the UK¹](#), found that, with limited time, journalists were becoming over-reliant on easy-to-digest press releases written by the communications departments of journals and universities. They were finding it hard to carve out time to pursue an exclusive, investigative story or feature.

Where do science writers work?

A quick tour through science journalism outlets in the UK

MOST OF THE MAJOR NEWSPAPERS in the UK employ specialist science, health, technology, or environment reporters, as do news magazines such as the *Economist*, *Time*, and *Newsweek*. Magazines written for the science-interested public include *New Scientist*, *Scientific American*, *Wired*, *National Geographic*, and *Discover*. There are also many specialist publications that maintain news sections and whose main audience is working scientists, engineers, or medical professionals, such as *Science*, *Nature*, *Chemistry World*, *IEEE Spectrum*, *Physics World*, *The Lancet*, and the *British Medical Journal*.

In broadcast media, the BBC accounts for the vast majority of UK jobs in science journalism and writing; outlets such as Channel 4, ITV, and independent production companies offer a handful more. There is also a thriving industry of science podcasts, some of which are spin-offs from other media.

The landscape of professional science journalism and writing is in transition because the internet and other digital platforms are driving rapid change in the media as a whole. Print circulations of newspapers and magazines are falling as readers migrate to online sources and mobile devices to consume their news; at the same time, print advertising revenues have dropped. In the United States, the contraction of print science journalism has caused a major decline in the number of newspapers maintaining science sections. In the UK, according to the [2009 Williams report](#)¹, the number of science, health, and environment journalists across the national news media almost doubled between 1989 and 2005, rising from 43 to 82, mostly due to an increase in positions at the BBC. Since then, numbers have remained relatively stable. The same report indicated, however, that numbers in the US had dropped substantially as newspapers dropped specialist correspondents and sections.

The internet also helps explain the expansion of science media and communication offices run by universities, charities and other science-related organisations. Where once these organisations mostly publicised their work via press releases sent out to the media, now they can reach their audience directly by writing and publishing material online. A second factor is that funders have begun requiring them to engage in this broader outreach to ensure their research reaches as broad an audience as possible.

Graduates from City University's (London) MA in Science Journalism have found jobs reporting in a wide range of journalism outlets including the BBC, ITV, Research Fortnight, The Economist, SciDev.net. Others have moved into the charity and NGO sector to report for organisations such as Greenpeace.

Blogging and social media

THE LAST DECADE has seen a rapid proliferation of science blogs, many of which are part of traditional media's expanded online networks, such as those hosted by *Scientific American*², *Wired*³, *Discover*⁴, and the *Guardian*⁵ or Conde Nast Digital (ars.technica). Others are part of newer blog networks, and many well-regarded blogs are one-person operations. The blogging ecosystem is diverse: scientists and journalists alike are running their own blogs; newspapers and media organisations host blogs; and blogs are also helping develop and launch a new generation of science journalists such as Brian Switek (*Laelaps*⁶) and Ed Yong (*Not Exactly Rocket Science*⁷). Easy to use platforms such as WordPress mean that anyone can quickly start a blog.

Social media, particularly Twitter, have also become an integral part of many science journalists' toolbox. They find such aggregators a valuable way to find or follow stories and to communicate directly with their audience. Some journalists tweet prolifically, build up a huge following and use the medium to help establish a reputation and increase their readership. New experiments in communicating science through digital and social media emerge every month, reflecting the rapid development of digital tools.

What do science writers earn?

THE NATIONAL COUNCIL FOR THE TRAINING OF JOURNALISTS (NCTJ) 2013 survey reported an average salary for a newspaper journalist of £22,250. Trainee reporter's salaries may be as low as £12,000-£15,000 depending on whether it is a local, regional or national paper. The survey suggests with five years' experience salaries rise to £25,000 and those with a ten years' experience or more can expect up to £35,000-£40,000.

Salaries in broadcasting depend on what you do; behind-the-scenes journalists are broadly in line with the print outlets. If you are high-profile, on-screen talent, you could earn a lot more... but there aren't many of these. Radio science presenters are mostly freelance, and freelancing for radio is not a way to get rich. The NUJ issues [a guide to freelance rates](#)⁸ which can vary enormously depending on outlet. The ABSW also has its own [fees survey](#)⁹.

Few make a living from blogging alone, and those who do work for large blogging sites or networks. Most writers, especially freelancers, blog for free, because they love to write and because it helps to build an online presence. Freelancers contributing to commercial science blogging networks, may find the pay is quite small. The pay for traditional-style reported articles written for bigger media outlets is likely to be closer to that of traditional print and broadcast outlets.

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What skills do you need to be a science writer?

TO BE SUCCESSFUL IN SCIENCE JOURNALISM AND WRITING, talent, hard work and experience are more important than any qualification. You need a deep interest in science and a flair for clear, compelling writing.

There is no set route into science journalism. Some people in the profession today trained in journalism and later specialised in science; others went from science to journalism. Writer and blogger Ed Yong has an [excellent collection of mini-biographies](#)¹⁰ from science writers about how they got started. In the past, many journalists entered the profession by finding a junior reporter position at a newspaper or other media organisation. They learned their skills on the job and worked their way up. But the contraction of some media organisations and the increasing popularity of science journalism and writing as a career mean that those entry-level positions are more competitive than ever. Those wanting freelance, rather than staff, careers will need to cultivate the additional skills they will need to navigate networking and business management for themselves.

Today, almost everyone coming into the field has an undergraduate degree (although there is no requirement that this be a science degree) and a growing proportion has also attended a postgraduate science journalism, writing or communication course. Students on these courses, of which there are close to 20 in the UK and more than 50 in the United States, gain skills ranging from writing a lengthy feature article to reporting, shooting, and producing a short documentary, as well as basics of essential areas such as libel law. It's not essential to have completed such a postgraduate course to enter the profession, but it can ease your way into this competitive field. As well as building skills and confidence, a course can help open up a network of contacts. For example, some science programs have established links with science media organisations and help set up internships there. The disadvantages of a science journalism/science communication course are the time, commitment, and expense, estimated at about £9,000. Prospective candidates should carefully research the course they're interested in and examine whether and where recent graduates have landed jobs as an indicator of whether the course is likely to enhance job prospects. The ABSW maintains a [helpful list of courses](#)¹¹, as do [Wikiversity](#)¹² and the [Guardian](#)¹³. The ABSW's [biannual conference](#), the [UK Conference of Science Journalists \(UKCSJ\)](#)¹⁴ also offers helpful resources, and the World Federation of Science Journalists offers a [free online course](#)¹⁵.

Besides a talent for writing, the directors of science journalism courses say that they also look for some of the following skills and attributes in prospective students: evidence that an applicant has tried writing or journalism by, for example, blogging, writing for an institutional newsletter, website, or local newspaper, or taking an evening course; and evidence that a candidate has carefully researched the field and is committed to it and has a good nose for a story. Science media employers look for evidence of an outstanding candidate in his or her references and, more importantly, in a portfolio of published or broadcast work.

How do I get a foot in the door?

THE BEST WAY TO WORK OUT IF SCIENCE WRITING OR JOURNALISM is a good career choice for you is simply to have a go. Take small, practical steps that allow you to try out a little writing or other medium without sucking up all your time. You could start a blog. You might write for a university magazine, newspaper or website; several universities now operate their own science news magazines. If you're interested in broadcasting, work at a university or hospital radio or TV station. You might ask the staff at your institution's communication office if you could write or record an interview. Or perhaps sign up for an evening class in non-fiction writing. Any of these activities should give you a feel for what's involved and whether you like it. Should you end up applying to a science journalism course, it will also demonstrate your commitment and provide you with some work to show.

There are also other ways to start informing yourself about the field and integrating yourself into it. Read newspapers, magazines, news sites, and blogs voraciously; watch TV science programmes, listen to science on the radio, consume podcasts and videos and other science media. Research the field by talking to people who are already working in it about how they started, and what it's like.

Joining the ABSW has many benefits: the association organises regular events for aspiring science writers, including opportunities to meet working writers and editors. It also operates email discussion groups with information about jobs, internships, trips, and other useful exchanges about issues facing practicing journalists and writers. Other professional writers and journalists' organisations (see list below), such as the US National Association of Science Writers¹⁶ (NASW), offer similar services.

You will also find that there is a thriving online community of scientists, science communicators, journalists, and others passionate about science — and integrating yourself into this group through blogging and social media is another excellent doorway into the field.

Twitter and other social media mean that anyone can join the conversation and establish a presence for themselves if they have something interesting to say. This means getting online, reading and commenting on science blogs, becoming familiar with and known to the community and the blogging networks, and experimenting with Twitter, Facebook, Tumblr, and other social media if you aren't already. Starting your own blog — or commenting or offering to guest post on someone else's — helps writers practice and find their interests and writing style.

“The best way to work out if science writing or journalism is a good career choice for you is simply to have a go.”

Internships, fellowships and competitions

SCIENCE JOURNALISM AND WRITING INTERNSHIPS, which are offered by many science media organisations, are an excellent way to gain experience and contacts. Some of these are advertised on the ABSW website and by the NASW jobs list in the US. Competition for some of the most prized internships can be stiff, however, and you may be up against top candidates coming out of science journalism programs in the UK and abroad.

There are other opportunities to get a taste of the media. Working scientists, engineers and clinicians can apply for one of ten British Science Association Media Fellowships¹⁷ that are awarded each year: these are three to eight-week placements at media organisations designed to give participants a greater understanding of the media.

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It can also be worthwhile entering competitions aimed at beginning writers. The ABSW Science Writers’ Awards for Great Britain and Ireland¹⁸ (that run annually) include categories for Student Science Blog, Student Science Publication and Best Newcomer.

Where can I find out more?

The Association of British Science Writers (ABSW):

<http://www.absw.org.uk>¹⁹

Further Reading

Blum, Deborah and Mary Knudson, eds., *A Field Guide for Science Writers: The Official Guide of the National Association of Science Writers*, 2nd edition Oxford University Press, 2005.

Thirty-five Writers of SciLance, *The Science Writers’ Handbook*. SciLance, 2013: <http://pitchpublishprosper.com/science-writers-handbook/>.

Council for the Advancement of Science Writing: A guide to careers in science writing available at <http://casw.org/casw/guide-careers-science-writing>

National Association for Science Writers: FAQ for new and aspiring science writers available at <http://www.nasw.org/faq-new-and-aspiring-science-writers>

Professional organisations

Association of British Science Writers: <http://www.absw.org.uk/>

US National Association of Science Writers: <http://www.nasw.org/>

Medical Journalists’ Association <http://www.mjauk.org/>

Guild of Health Writers <http://www.healthwriters.com/>

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Links

- ¹ http://cf.ac.uk/jomec/resources/Mapping_Science_Journalism_Final_Report_2003-11-09.pdf
- ² <http://blogs.scientificamerican.com/>
- ³ <http://www.wired.com/blogs/>
- ⁴ <http://blogs.discovermagazine.com/>
- ⁵ <http://www.guardian.co.uk/science>
- ⁶ <http://phenomena.nationalgeographic.com/blog/laelaps/>
- ⁷ <http://blogs.discovermagazine.com/notrocketscience/>
- ⁸ <http://www.londonfreelance.org/feesguide>
- ⁹ <http://www.absw.org.uk/reading-room/guides/freelance-pay.html>
- ¹⁰ <http://blogs.discovermagazine.com/notrocketscience/2010/07/29/on-the-origin-of-science-writers/>
- ¹¹ <http://www.absw.org.uk/reading-room/so-you-want-to-be-a-science-writer/so-you-want-to-be-a-science-writer11.html>
- ¹² http://en.wikiversity.org/wiki/Science_communication_in_the_United_Kingdom#Science_journalism
- ¹³ <http://www.theguardian.com/guardian-masterclasses>
- ¹⁴ <http://www.ukcsj.org/>
- ¹⁵ <http://www.wfsj.org/course/index-e.html>
- ¹⁶ <http://www.nasw.org/>
- ¹⁷ <http://www.britishscienceassociation.org/web/scienceinsociety/MediaFellowships/>
- ¹⁸ <http://www.absw.org.uk/absw-awards/awards.html>
- ¹⁹ <http://www.absw.org.uk>