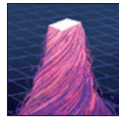


Those attitudes seem strikingly familiar today. At the time, the founders of the Public Library of Science initiative (then PLS, now reborn as the publisher PLoS) urged that research results should be stored in free, online, centralized repositories. Technology enthusiasts sang the praises of easy search and retrieval across a wide range of publication formats beyond the traditional journal article, but warned of the need for common standards. Publishers pointed out that someone would have to finance the publication of the increasing tide of information, and debated where revenue sources should come from.

There was a voice missing from that debate: yours. More than a decade on, this journal's publisher, Nature Publishing Group (NPG), tried to remedy that by surveying more than 23,000 scientists about their experience of and opinions on open-access publishing. The key question is not just what scientists could have, but what they want. The survey results — which NPG plans to release soon — suggest that many scientists are still thinking through their views on the open sharing that the Internet enables, and on whether they want to publish their research openly.

One preliminary result that stands out is the diversity of experiences and attitudes across disciplines. In biology, 17% of papers published by the respondents over the past three years had been immediately made free for all to read by paying the publisher up front, and more than half of the biologists surveyed said that they had published at least one such paper. In chemistry, the proportion of papers was just 4%, and less than one-quarter of chemists had published at least one open-access paper. More than half of biologists felt that “all papers should be published open-access”, whereas just under one-third of chemists agreed (the remaining one-third of chemists neither agreed nor disagreed).

Nor do scientists hold consistent views about how widely



## THE FUTURE OF PUBLISHING

A *Nature* special issue.

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information should be shared and reused. In the NPG survey, 45% felt that all papers should be published open access, but only 22% wanted to allow articles to be reused for commercial purposes. A differently worded survey by publishers

Taylor & Francis of some 14,500 scholars (split between sciences and the arts and humanities) found a similar inconsistency: 40% strongly agreed or agreed that their work should be “reused in any way”, but only 18% said that it was acceptable for others to use their work for commercial gain (W. Frass, J. Cross and V. Gardner *Open Access Survey* Taylor & Francis; 2013). The figures perhaps represent a lack of understanding rather than deeply considered views. For example, when NPG asked scientists which open-access licence they had chosen, including share-alike, no derivatives and CC-BY, 85% of people said: “I don't know”.

New technologies allow a much greater and faster transition to a digital future, and this week's special issue reveals that scientists are finding a multitude of ways to publish and access their research results. As this journal has noted before, the future of research literature will ideally be an amalgam of papers, data and software that interlinks with tools for analysis, annotation, visualization and citation. The need for common standards is as great as ever.

But it is demand, not supply, that will shape how scientists and publishers grasp these opportunities. For instance, a key reason that online open-access journals are now accepted as a mainstream (if still minority) method of publishing research is because of the mandates steadily introduced since 2001 by institutions and by research funders.

The dazzling variety of publishing options will fragment the information available on the web. Scholars need to think through how they would like that information to be shared and reused — answers may be different for the various disciplines. One revolution does not yet fit all. ■

# Push the boat out

*The latest private research vessel to be launched could open up the world of marine science.*

The 1984 film *The NeverEnding Story* opens with a bullied boy who forgets his troubles when he reads about an alternative world called Fantasia. So it is tempting to ask whether a new private research vessel, named after one of the characters from the film, can offer hard-pressed oceanographers a similar escape.

As we report on page 420, the R/V *Falkor* has launched into troubled waters for marine science. Ship time is hard to come by, and funds for academic ocean research are shrinking, at least in the United States. More than ever, researchers are needing to cobble together money from several sources to pay for voyages that, in the past, might have been funded through one overarching grant.

Arriving at a rate of knots on this scene are private foundations. The Gordon and Betty Moore Foundation in Palo Alto, California, for instance, has a marine-microbiology initiative that explores sites ranging from coastal upwellings to deep-sea sediments. But it does not accept unsolicited proposals from scientists.

The non-profit Schmidt Ocean Institute, which operates the *Falkor* from its base in Palo Alto, does. It is open to applications to use the ship — for free — for studies that highlight the challenges that the world's oceans face. The money comes from institute founder Eric Schmidt, former chief executive of Google.

Many researchers are sceptical about the genuine scientific value of millionaire marine philanthropy. It is fashionable to send well-equipped expeditions to little-known parts of the sea, but such efforts seldom connect with the wider scientific community — although film director James Cameron said this week that he would donate his *DEEPSEA*

*CHALLENGER* submersible to the Woods Hole Oceanographic Institution (WHOI) in Massachusetts. The *Falkor*, however, is meant to be a long-term resource for use by anyone who can get his or her proposal accepted by a peer-review panel.

The ship deliberately has no home port, so as to keep away from territorial claims to one ocean basin or for one country. US and Canadian scientists are scheduled to lead its first few cruises, but that is mainly an artefact of how the Schmidt institute started up. Its programme managers personally visited leading oceanographers in those countries to introduce the *Falkor* and to encourage them to apply for ship time. Non-Americans seem to be taking note; in the latest round of proposals, scientists from 23 countries applied.

The *Falkor* signals the future of oceanography in other ways. It is, at heart, a Google ship, and as such promotes projects that integrate the latest technology into ocean exploration. Some academic outfits, such as the WHOI, already push this limit, but the Google crew has some ideas of its own and scientists will follow them eagerly. The Schmidt institute also prods its shipboard scientists to release their data openly and rapidly, following the strong precedent set by the Moore foundation.

A small ship such as the *Falkor* will not solve all the woes of oceanographers. One possible stumbling block is that the Schmidt institute awards only ship time; scientists must come up with their own funding to pay salaries and for post-cruise science. Thus, only researchers who are accomplished enough to secure funding from other sources will be able to spend time aboard.

The *Falkor* has much to offer, but it will not and should not replace the current US research fleet, which is due to receive much-needed upgrades over the next ten years that will allow it to push the boundaries of marine science further than ever before.

*The NeverEnding Story* was a joint project of film-makers in Germany and the United States. The *Falkor* was originally a German fishery-protection vessel. With fair seas and a following wind, its story has some way to run yet. ■

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