

## Dr Dave Roberts and Vince Smith

Dave Roberts and Vince Smith of the Natural History Museum examine the copyright system and its impact on the field of science, technology and medicine. They argue that reducing restrictions to access and embracing new licensing models is essential to support scientific progress.

For working scientists copyright is at best an irritation and at worst an obstruction. The process of science requires the sharing of results so that both the individual researcher and their institution build reputation and the esteem of their peers through recognition of the quality of their work. Traditionally this has been done by publication on paper and has been characterised as a workflow where scientists, the majority of whom these days are publicly funded, create manuscripts that they submit to publishers, who get other scientists to evaluate and comment on the work (peer review). The publisher sells the result back to the scientists. In the classic model, used to defend copyright, the money made by publishers is apportioned between the creator (author) and the publisher. In science, not only does the author not see any money from their work, but the publisher demands an exclusive right to that income in perpetuity.

From an historical perspective it is easy to see the contribution made by the publisher. Author's copy was often hand-written or, at best, typed, so the publisher was responsible for copy editing, layout and typesetting. Distribution was fairly specialised with many publishers selling to many libraries, giving both sides a challenge. The arrival of computers and the internet has radically changed this workflow. Some publishers still undertake some light copy editing, but their primary contribution is distribution and, increasingly, as maintainers of archives as more of their publications move to an electronic format. In today's more competitive market, publishers are also spending more on promotion of their titles.

Many publishers in the STM (science, technology and medicine) sector have made extremely healthy profits from the general expansion of science: the number of pages published annually has risen exponentially. The driver for much of this expansion has been the development of bibliometrics that managers use as a method of assessing scientific performance, so scientists strive to produce ever more papers as their engine of career development. In science, as many other fields, we progress by standing on the shoulders of giants: in other words building, on the base of published knowledge. This is where copyright creates obstacles. Publishers recover their costs and make their profits from sales of their books and journals over a comparatively short time-frame, with most publications having short sales windows.

The internet has fundamentally changed this situation. Scientists who previously have gone to a library now use the internet, so publishers have a new revenue stream by selling the same material long after their business model recovered their original profit margin.

The internet also enables anyone to disseminate scholarly work through tools and services that are increasingly being developed outside the traditional publishing sector. In this environment copyright is often ignored because it is too complicated, or used as an excuse for inaction by research organisations who are often terrified by the risk of litigation. Realistically, there is little money at stake for the rights owners of this scholarly intellectual property beyond its initial publication. Re-purposing previously published material is how science progresses. The convention and only expectation is that such extracts will be properly credited. There is also a very real argument that factual content in the scientific literature cannot be subject to copyright. The typography is copyright, but is that any excuse to say that someone should not copy and extract an element from a previous publication?

The open science, or open research, movement advocates unrestricted access to scientific materials, both raw data and observations on those data. It most often uses a licensing system such as Creative Commons (<http://creativecommons.org>), a framework that puts the author in charge of defining how works can be utilised.

For scientific publishing:

- We urgently need to separate cases where there is substantial loss of income to a content creator though content dissemination (e.g. a professional musician) from those that make no income from dissemination and rely on this as part of their scholarly activities (e.g. a professional scientist). A positive start could be made by removing copyright restrictions on material older than, say, two years from its original publication date.
- Orphan works should be placed in the public domain.
- Making copies for strictly archival purposes should not be subject to copyright control. Libraries in particular should be able to preserve digital copies in perpetuity, which technologically means regularly making copies.