cancelling print subscriptions have frequently met resistance from faculty members. But a marked shift of resources from print to electronics is already under way as libraries take advantage of electronic publishing to cut overheads. And many scientists hope that electronics may bring a more fundamental reform of the economics of scholarly publishing, and a solution to the ‘serials crisis’.

Many feel that publishers of high-price, small-circulation journals are making excess profits. One critic is Mark McCabe, an economist at the Georgia Institute of Technology in Atlanta, who spent seven years at the US Department of Justice’s antitrust division investigating anti-competitive practices. He says the profit margins enjoyed by many publishers exceed those that would be expected in a properly competitive market.

Commercial publishers argue that they have higher costs than not-for-profit societies, whose journals are often subsidized by membership fees, and that increases in the quality and size of journals have raised prices. But McCabe maintains, for example, that it is difficult to justify the doubling of the cost of Elsevier’s Brain Research between 1992 and 1996 to $15,000 annually. Elsevier Science was unavailable for comment.

Libraries strike back
Libraries and scientists are now striking back, the ultimate goal being to return control of scholarly publishing to the non-profit societies and what they consider to be responsible publishers. Using electronic journals to achieve this is the goal of HighWire Press, a not-for-profit outfit set up in 1995 by Stanford University Libraries and Academic Information Resources to help universities and societies to publish at low cost.

Michael Keller, publisher of HighWire, says he was concerned that large companies with more money to invest would squeeze not-for-profit publishers out of the electronic journals market. He hopes that HighWire will help “correct the market”, by increasing the output and quality of society journals. “This market problem has taken 40 years to come about; my guess is it will take ten to fifteen years to remedy.”

HighWire now has more than 100 journals in its stable, including the Journal of Biological Chemistry — the world’s most cited journal — Science and Proceedings of the National Academy of Sciences. Just before Christmas, Oxford University Press transferred responsibility for production and hosting of electronic versions of 160 journals to HighWire.

The Scholarly Publishing and Academic

Gateway to literature: IST’s Web of Science takes readers to the full text of more than 100 journals.

Resources Coalition (SPARC), set up in 1997 by the US Association of Research Libraries (ARL), is even more aggressive. It is underwriting the launch of journals aimed at competing head on with expensive titles, with its 114 member libraries promising to buy each of them (see Nature 393, 719; 1998).

SPARC has teamed up with the UK Royal Society of Chemistry to launch an electronic journal, PhysChemComm, that will sell at $353 and is intended to compete with Elsevier’s $8,000 Chemical Physics Letters. But Elsevier complains that like is not being compared with like, and that another of its journals, Electrochemistry Communications, sells at $350.

The most dramatic example of rebellion is perhaps the recent decision by Michael Rosenzweig, a researcher at the University of Arizona, to defect, along with the entire editorial board, from the Wolters Kluwer journal, Evolutionary Ecology Research. Rosenzweig had become disenchanted with price increases at the journal which he established 12 years ago, and has allied with SPARC to create an alternative that will sell to institutions at around one-third of the $777 price of the Kluwer journal.

“I think the broad support that SPARC has received speaks of a broad frustration among [researchers] with the situation and a belief that it is time to become part of the solution,” says Mary Case, director of ARL.

Market distortions
The success of such electronic ventures is far from guaranteed, however. Despite enjoying library support, electronic journals face similar difficulties to those of any new journal in getting established and attracting authors.

Gregory Fu, a chemist at the Massachusetts Institute of Technology, also points out that, from a user’s perspective, “unless PhysChemComm delivers a knock-out blow [to its competitors] it just becomes one more journal that I have to put on my list to browse; so long as the Elsevier journal has good papers I will still need to check it”.

Case admits that her optimism is tempered: “If new SPARC titles can draw papers away from top expensive competitors, there should be a decrease in size or quality and eventually a decrease in price. There may be some modest effect on prices, as much due to the publicity that SPARC is generating as to the introduction of competition.”

In physics, the Los Alamos e-print repository — where preprints submitted direct by

User consortia emerge as ‘brokers’

In addition to efforts by scientists to create competing products, publishers face the threat of more organized action — and perhaps even a boycott — by consortia of libraries and other users intent on forcing down prices charged for electronic content.

Library consortia, established in the 1930s to cooperate in administering interlibrary loans, have over the past two years taken on a new role: squeezing better deals out of publishers for electronic licences. The movement is becoming international; the International Coalition of Library Consortia (ICOLC), set up in 1997, groups 79 library consortia in North America, as well as a growing number in other countries, including the United Kingdom, Germany and Australia.

Two dramatic examples are OhioLink, a consortium of 74 Ohio libraries, which negotiates state-wide access and provides a common interface to users, and the new National Electronic Site Licence Initiative (NESLI), which is intended to serve Britain’s entire higher education system.

NESLI was created by the Joint Information Systems Committee, a body established by Britain’s higher education funding councils to coordinate the use of information technology by the higher education and research communities. The contract to manage NESLI has been won by a consortium led by the University of Manchester and Swets and Zeitlinger, one of the world’s largest intermediaries in the distribution of scientific information. Their brief is “to lessen the financial, legal and technical barriers to the take-up of electronic journal provision… and negotiate value for money deals with publishers”.

Paul Harwood, director of Swets and Zeitlinger UK, says NESLI has approached 60 publishers and will begin making electronic journals available this month. “Any [financial] impact will only be seen in subscription years after 1999,” he adds.

“NESLI is an attempt to offer a complete service for the UK higher education community, from negotiation to access,” says Harwood. He says the initiative will “try to bring some order to a chaotic world by offering a single service for the complex and time consuming aspects of arranging licences and access to electronic journals”. California State University has taken this approach a step further, and turned the
Serials crisis: journal price inflation is bad news for libraries but is giving a push to web publishing. Scientists are automatically made available free — now serve tens of thousands of users worldwide and process millions of electronic transactions per month. In many fields of physics, they have supplanted journals in distributing primary literature. Yet the repository has not dented the financial health of physics journals.

Although this is partly because journals satisfy a demand for peer-reviewed collections, it also reflects what many see as distortions in the publishing market. Scientists depend on publishing for career advancement, but they do not pay directly for journals, so have no incentive to stop submitting to high-priced titles. And, as long as publishers attract good authors, libraries will come under pressure to buy journals, some of which they cannot afford.

ARL data show that library spending per US faculty member averages $12,000 per year. "If researchers internalized the price of journals in their budgets they would behave differently," argues McCabe.

The lack of direct accountability of researchers for publication costs is also inhibiting one promising model of Internet publishing, based on billing authors page charges to publish, and then making the journal free. Authors have little incentive to pay page charges when they can publish elsewhere for free.

The viability of the model has been demonstrated by one electronic journal, the Florida Entomologist, which charges authors $45 per printed page and $20 for each figure or table. Thomas Walker, its editor, says adoption of page charges by other professional societies would allow inexpensive journal production, while making information more widely available.

At a broader level, a grassroots movement has emerged over the past year — mainly in the United States — whose goal is to challenge the common practice whereby publishers retain copyright of articles and forbids reuse of the work elsewhere. A compromise that gives researchers greater control of their published work now seems inevitable.

Some publishers have begun relaxing the terms of copyright agreements to allow researchers to resubmit articles to other media, such as digital libraries. Several US universities, including Caltech, are contemplating achieving the same goal by requiring researchers to retain copyright over their papers and licensing them to publishers (see Nature 396, 293; 1998).

One-stop shopping Whatever happens, a shake-out of the scholarly publishing market seems inevitable. In his book, Information Rules: A Strategic Guide to the Network Economy (McGraw-Hill, 1998), Hal Varian, an economist at the University of California at Berkeley, argues that the economics of the Internet renders unstable the traditional oligopolies achieved by economies of scale. Instead, the Internet tends to be populated by companies with temporarily dominant positions, which can be usurped almost overnight by competitors with better technologies or more attractive features.

The prospect of a few web science publishers roughly equivalent to the online bookseller Amazon.com, offering one site from which you could find the full text of articles from every journal at the click of a mouse, is not so far off.

The promise of 'a library on the desktop' has finally begun to become a reality over the past 12 months, and user demand for the extra capabilities of electronic journals is driving libraries inexorably towards an electronic future. "We are in a transition phase, but electronics will come to dominate because it has all the features and values," says Mike Stout, head of electronic journals at Oxford University Press.

Tables on vendors of scientific journals and databases. Just before Christmas, it announced that, instead of negotiating individual deals, it would put out to competitive tender a contract for the building of a database to supply all its 22 campuses with 1,300 specified journals. Like Ohiolink, it also aims to provide a common database and interface to electronic journals for all its students and faculty members.

Its action is partly a response to the practice of many publishers and intermediaries of selling licences to all their electronic journals, or large bundles of them. Many libraries are concerned that as a result they will be required to pay for journals they do not want. "As the bundled database grows, there will need to be concomitant price increases," argues Mary Case, director of the US Association of Research Libraries. "I am not convinced that such increases will be moderate."

Case believes that it would be impossible under US law for university-based consortia to go so far as to organize a boycott of expensive journals. "Such organized activity is illegal," she points out, as it would constitute antitrust practices.

But Mark McCabe, a former official at the US Department of Justice, says the department might grant immunity to departments might grant immunity to practicing achieving the same goal by requiring researchers to retain copyright over their papers and licensing them to publishers.

Power to the scientists: HighWire assists learned societies and universities to publish on the web.