Library and Information Services in Astronomy IV
July 2-5, 2002, Prague, Czech Republic
B. Corbin, E. Bryson, and M. Wolf (eds)

Mergers, Acquisitions, and Access: STM Publishing Today

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Abstract. Electronic publishing is changing the fundamentals of the entire printing/delivery/archive system that has served as the distribution mechanism for scientific research over the last century and a half. The merger-mania of the last 20 years, preprint pools, and publishers' licensing and journals-bundling plans are among the phenomena impacting the scientific information field. Science-Technology-Medical (STM) publishing is experiencing a period of intense consolidation and reorganization. This paper gives an overview of the economic factors fueling these trends, the major STM publishers, and the government regulatory bodies that referee this industry in Europe, Canada, and the USA.

1. Introduction

The mergers and acquisitions (M&A) most discussed at astronomy meetings are those involving colliding galaxies. However, a major economic change in the ownership of scientific-technical-medical publishing is impacting astronomy information resources, and mergers and acquisitions are the main components of that change. Mergers, the combination of two or more companies to form a new company, and acquisitions, the purchase of an asset such as a company, are pursued for economic ends. The motivations for these activities include increased market share, control of a niche market, economies of scale, increased product offerings, and of course, the bottom line: increased profits.

Publishing was not always looked upon as a high-profit sector. In the USA, since the 1920s average profits reported by publishers have hovered around 4%, after taxes. Among major independent French publishers, Gallimard has an annual profit of a bit over 3%, and Le Seuil just over 1% (Schiffrin 1996).

Publishers produce a range of titles, and traditionally, the bestsellers finance the poetry. Two recent memoirs, *The Book Business: Publishing Past Present and Future*, by Jason Epstein, and *The Business of Books: How International Conglomerates Took Over Publishing and Changed the Way We Read*, by Andre Schiffrin, have described how the acquisition of a smaller firm by a larger entity changed the climate from one in which employees believed in their mission to publish good titles, which compensated for low salaries, to one in which each title is expected to make money and executives demand the salaries and perks of industry moguls. The 1961 purchase of Alfred A. Knopf by Random House

created an unusually large establishment for the time, but the 1965 purchase of Random House by entertainment firm RCA was more of a departure.

The merger mania that characterized national and global economies in the 1970s and 1980s spread to publishing: in 1980, Advance Publishing acquired Random House for $80 million; Simon & Schuster bought Prentice Hall in 1984 for $718 million; I.R. Maxwell purchased Macmillian; Rupert Murdock's firm, News Corp., bought Harper & Row and merged it with Collins. Viacom, with Sumner Redstone as chairman, bought Simon & Schuster.

2. Mergers and Acquisitions in Publishing: 1990–2002

The merger mania continued into the 1990s, with a host of consolidations: Bertelsmann, a German firm that already owned Bantam, Doubleday, and Dell, bought Random House for $1.5 billion, and followed up with the purchase of 80% of Springer Verlag for $600 million. Elsevier bought Compendex, the major engineering bibliographic database, and its Web site EI Village; Wolters Kluwer bought Plenum. In an example of the type of complex transaction that is becoming more common, Pearson bought Simon & Schuster for $4.6 billion. Pearson then split up the new purchase, reselling Jossey-Boss, a social science and humanities publisher, to John Wiley & Sons for $82 million, and the Macmillian General Reference Group to IDG, the producer of the ". . . for dummies" series, for $8.3 million (Munroe 2000).

The most publicized deal of this period didn't materialize. In 1998, the industry was abuzz about the proposed Elsevier/Kluwer merger. Elsevier's holdings included Pergamon, North-Holland, Excerpta Medica, The Lancet, LEXIS-NEXIS (1994), the Congressional Information Service, BioMedNet (1997), Beilstein (1998), and Engineering Information, Inc. (1998). Wolters Kluwer owned Chapman & Hall, Lippincott (1990), Plenum Publishing (1998), and CCH. And then the word spread that the deal was off. It was rumored to have foundered on overlaps in European legal publishing coverage. However, no regulatory agency had prohibited the merger. It is more probable that economic considerations caused the principals to back away from the proposal (Hannay 2001).

The widely reported acquisition of Time Warner by AOL for $165 billion, acclaimed as the ultimate marriage of the Internet and traditional publishing, shows how heated the merger scene had become.

Cambridge Scientific Abstracts (CSA) bought R.R. Bowker and immediately sold sections to Information Today, Inc. Taylor & Francis (T&F) acquired Gordon & Breach for $31.5 million, one of eight companies T&F purchased since 1998. Vivendi, the French firm that already owned Universal Pictures and Universal Music, bought Houghton Mifflin, the fourth largest educational publisher in the USA, for $2.2 billion.

Compared to the AOL Time Warner deal, Reed-Elsevier's purchase of Harcourt General for $5.7 billion seems small, but its impact on STM publishing is momentous. In this complex transaction, Reed-Elsevier retained Harcourt's STM and K–12 publishing segments, including Academic Press (IDEAL), but immediately sold Harcourt's higher education and corporate training sections to Thomson. This gives Reed-Elsevier control of 125 of the 500 most cited science journals (Malakoff 2001), more than a third of the 1,400 established

medical journals (Kirkpatrick 2000), and about 20% of STM journal market overall (Economist 2001).

The five largest US publishers are all owned by media conglomerates (Milliot 2001a). When this consolidation in the industry is decried for limiting opportunities for the output of specialized, non mass market titles, the university presses are often identified as providing the solution. However, in 2001, Iowa State University Press (ISUP) was purchased by Blackwell Science for $2 million dollars. The university had long required the press to operate on a cost-recovery basis. ISUP found that it could not earn enough to purchase the necessary computers and software to move into electronic publishing. By accepting the $2 million dollars from Blackwell, ISUP trustees hope to have $100,000 a year to support scholarly publications (Orlans 2001). If this becomes a trend among university presses, the number of independent publishers will be further decreased.

Wolters Kluwer showed an appetite for database providers, purchasing Ovid Technologies in 1998 for $200 million, and SilverPlatter in 2001. Swets and Blackwell, two major journal subscription agents, merged in 2000. The next year, the new entity, Swets Blackwell, acquired Martinus Nijhoff, a Dutch competitor. Consolidation has also been occurring among book jobbers: Blackwell Books Services purchased Academic Book Center, Baker & Taylor bought Yankee Book Peddlar, Ingram acquired The Bookmen, Inc., and R.R. Bowker obtained PubNet, an electronic ordering network for bookstores.

Noting that electronic delivery options have produced a new context in which "the role of the publisher as content provider is reduced ... to a role more akin to a content broker," Paul Evans, director of Elsevier Advanced Technology, describes how Elsevier has decided to position its self for continued growth and profitability through new service developments and advantageous acquisitions (Evans 2001). As part of that plan, Elsevier has moved away from the segment of journal publishing dependent on advertising and into the add-free, less volatile academic segment. Purchases have included database resources, such as American Petroleum Institute's Encompass. And in 2000, Elsevier purchased Endeavor, the library OPAC software used by dozens of libraries, including the Library of Congress and the University of Hawai'i Libraries.

3. Regulators

With consolidation progressing at a rapid pace internationally, the regulators of business purchases have not restrained continued concentration in publishing. GE was stopped from acquiring Honeywell, but no major publishing merger has been nixed. Regulatory powers are arrayed among a number of national and international agencies. In Europe, each nation has agencies such as the Minister for Competition and Consumer Affairs and the Competition Commission in the United Kingdom, while the European Union has an oversight body, the EU Commission. The purchase of Harcourt General by Elsevier was opposed by many library groups (ARL 2001). But after prolonged review, the deal was approved by the US Department of Justice and the UK Competition Commission (Milliot 2001b).

In the United States, regulatory authority is divided between the Federal Trade Commission (FTC) and Department of Justice (DOJ), and the antitrust

rule of thumb was that a merger or purchase must give one firm control of 35% of a market to trigger an intervention. In the past, the FTC had oversight of publishing. However, it has not stopped any major mergers. When Bertlesmann bought Random House, the Authors Guild and the Association of Authors Representatives objected that this would give Bertlesmann a 36% market share, but the deal was allowed to proceed. In March 2002, the FTC and DOJ announced a new agreement under which DOJ will now review mergers in the Internet, software, telecommunications, and entertainment fields. This change brought opposition from consumer groups because it removed media mergers from the oversight of five-member FTC (Mayer 2002).

The 1994 General Agreement on Tariffs and Trade transfers some authority formerly held by nations to the World Trade Organization (WTO). The 2002 World Intellectual Property Organization (WIPO) treaty outlaws both swapping technologies such as Napster and attempts to circumvent encryption, but publishing mergers have not garnered much attention from either WTO or WIPO.

4. STM (Science/Technical/Medical) Journals

The publishing of science, medical, and technical information has developed into a very specialized activity. Traditionally, STM journals have served as the main medium for research communications. The refereeing mechanism has provided quality certification, and libraries have provided archiving of the continuously growing body of literature. This special situation is very favorable for the publishers and was well characterized by Carol Kaesuk Yoon (1998):

> ... academia is a paradise for publishers. First the public pays for most scientific research through, for example the National Science Foundation. Then universities pay the salaries of scientists who do virtually all the writing, reviewing and editing. Universities sometimes even provide free office space to journals.
>
> Finally, authors typically sign over their copyright to publishers, who can sometimes bring in many millions of dollars a year in subscriptions for a single high-priced journal—subscriptions paid by university libraries supported by tax dollars and tuition.

STM journal subscription costs increased 11%+/year from 1990–2000, while during the same period the CPI only increased 2.6% per annum. Between 1996 and 2000, astronomy journal costs increased 19.03% (Ketcham-Van Orsdel & Born 2000). Only a small part of this inflation can be explained by an increase in the number of pages published. Nor can it be explained by the changes in the cost of production or the introduction of electronic technology. A recent comparison of the journal prices of commercial publishers to nonprofit (learned society) publishers has shown that the average nonprofit subscriptions are between 50–75% less than the commercial titles (McCabe 2001).

Because each journal is a unique entity with a reputation and position in the scientific publishing world, and some core titles are indispensable to coverage of a field, competition among STM journals does not function in the same manner as it does among trade magazines. This has created in imperfect marketplace characterized by controlled supply and inelastic demand, one in which

traditional balances of competition do not operate. Economist Mark J. McCabe has analyzed the STM publishing marketplace and notes that the 35% market share that customarily marked monopoly control does not apply. Because each journal has a narrowly defined focus, one title cannot be substituted for another. He proposed a portfolio model that identified a core group of titles and tracked their prices as a group, by publisher, enabling him to identify increases due to the "merger effect" (McCabe 2002) Mergers increase subscription costs. The Wolter Kluwer/Lippincott merger generated a postmerger (1991–1994) price increase of about 8.5% (McCabe 2002, p. 265). After Elsevier bought Pergamon, Pergamon titles increased 27% and Elsevier prices increased 8% (Case 2001). Economies of scale, if achieved, were not passed on to subscribers.

The advent of electronic delivery has prompted some publishers to bundle the electronic versions of their titles together and require libraries to subscribe to the entire group to gain access to a single title. Libraries object that this allows publishers to support marginal titles by bundling them with more important ones. STM publishers have also begun to offer electronic access to articles on a pay-per-view model, charging for each download without requiring a subscription to the journal itself, while offering libraries licenses that attempt to limit or prohibit interlibrary document sharing.

5. Library Responses

STM journal prices began their inflationary rise at a time when library budgets were shrinking, and libraries attempted several strategies to relieve budgetary pressures. First they redistributed funding from monographs to journals. This has lead to a decrease in the number of books purchased. The chief executive of book publisher W.W. Norton, W. Drake McFeely, has noted that 10 years ago publishers expected libraries to buy about 2,500 copies of a serious or literary book. Today, they can only expect to sell libraries about 1,000 to 1,500 of such a title. This makes it harder for small publishers and university presses to break even on their titles (Kirkpatrick 2000). During the last 15 years, libraries have reduced the number of books purchased by 26% (Kyrillidou 2000).

Almost every university library system in North America has engaged in painful journal cancellations projects in the face of spiraling journal subscription costs. Using ISI impact factors, consulting with faculty and checking with regional affiliates to preserve access, university libraries have cancelled thousands of journal titles over the last two decades.

Libraries also have greatly improved their document delivery/interlibrary loan services. What was a slow, labor intensive department has been transformed into a fast responding service that uses upgraded interlibrary agreements, email, fax, and scanning technologies to deliver articles in shortened turn-around times.

Libraries have stretched already overextended budgets to include as many electronic journal subscriptions as possible. Putting aside worries about long-term archiving, libraries have negotiated licenses providing short-term access to major titles, and have invested in network upgrades and proxy servers to seamlessly deliver articles to researchers' desktops.

To reduce costs and optimize collections between organizations, libraries have begun to form consortia for purchasing journals and databases at discoun-

ted prices. Most library consortia are geographically based, and many combine different types of libraries such as university with public and school. Because of the mixed membership, the consortia have seldom been able to extend their purchases to the expensive high-end science journals and databases. There are two notable exceptions: The Canadian National Site Licensing Project (CNSLP) represents 64 Canadian universities in negotiations for the full range of electronic scientific resources. Begun with a start-up grant from the Canada Foundation for Innovation, CNSLP has completed its first round of contracts. Long-term funding is under development. In the UK, the National Electronic Site Licence Initiative (NESLI) was established by the Joint Information Systems Committee. It is designed to promote the widespread delivery and use of electronic journals in the UK higher education and research community. The progress of these two efforts must be monitored in hopes that they offer models that can be used by other science libraries facing continued budget pressures.

6. Recommendations

In 1997, a Pew Higher Education Roundtable, sponsored by ARL and the Association of American Universities, identified five strategies to address the science journal pricing crisis (Webster 1999).

First, tenure and promotion decisions must move from quantity to quality. Well-done research must be identified and rewarded. Basing career advancement on numbers of articles published only increases the pressure to publish and may misrepresent true productivity.

Second, research libraries should define the marketplace by becoming collective buyers. Perhaps CNSLP and NESLI will provide a model that will permit small university, observatory, and research institute libraries, from both the developed and developing worlds, to unite and negotiate access.

The third strategy is to change intellectual property rights assignments to support research rather than drain it. When the annual subscription price of *Tetrahedron Letters*, a Reed-Elsevier journal, reached $9,036, the entire editorial board of scientists bolted, and started *Organic Letters*, costing only $2,438 per year. Increases in the subscription cost of *Machine Learning Journal* caused that editorial board to resign and create an alternative, *Journal of Machine Learning*. Other suggestions have included forming university-based publications, so that money accrued by copyright would return to the institutions supporting the scholars. A much publicized manifesto by the Public Library of Science (2000), has demanded that commercial publishers make the contents of their journals freely available six months after publication, with the signators threatening to withhold articles and editorial services from those that do not comply. This has yet to bring publishers to heel but is a measure of the emotions stirred by the journal pricing crisis.

The fourth strategy is to exploit electronic publishing developments, decoupling research reporting from paper-based publishing. Preprint pools like astro-ph are a manifestation of this. High Wire Press, a Stanford University development, has launched a number of electronic-only journals to offer first-quality research at subscription costs that give users the benefit of the cost saving provided by electronic publishing. The Scholarly Publishing and Aca-

demic Resources Coalition (SPARC), an organization of libraries, publishers, and learned societies established by ARL in 1998, works to bring these benefits to a wide range of titles, making them more affordable.

The fifth recommendation is to develop electronically mediated peer review. The peer review process must be managed by scientific communities, not by commercial publishers. Electronic document production developments by university and learned society presses, which include peer reviewing, may soon provide models for this.

The implementation of these five strategies would revolutionize STM publishing, making it possible for researchers at any facility that can support Internet access and printing equipment to have access to the full range of their disciplines' literatures and all the latest findings. The second suggestion, the formation of consortia, is clearly within the purview of libraries and is central to information resource development. Astronomy libraries should examine existing consortia for models that would support the formation of a freely available international electronic repository of astronomy research. In the United States, Medline, a comprehensive bibliographic medical database produced by the National Library of Medicine (NLM), has contributed to medicine's wonderful track record of cumulative research gains. The NLM has long provided free access to Medline via the PubMed software. The National Center for Biotechnology Information (NCBI) at NLM is currently developing PubMed Central, a freely available, full-text, digital archive of the life sciences journal literature.

Astronomy is a much smaller discipline than medicine. In ADS, researchers have a strong bibliographic database, providing links to those full-text articles provided by publishers. It also supports links to the pay-per-view options of publishers that do not provide free full-text access. The numbers and the costs of articles ordered via these commercial purchase options has not been reported. But what of occasions when the full-text is not available for free and there are no funds for document delivery? And, what of times where access to a subscription database like INSPEC is needed, but not available? How many promising lines of investigation are halted by these economic barriers?

It would be a fascinating experiment to provide all astronomy researchers worldwide with free access to specialized bibliographic databases and all the full-text articles indexed therein. Would five or ten years of enriched, barrier-free access to a range of databases and journals create a spike in quality research output? A working committee should be struck to investigate funding opportunities to support this worthwhile experiment. The (US) National Science Foundation's International Digital Libraries Collaborative Research and Applications Testbeds grant program may repay exploration. Anyone interested in joining a funding development working group should contact the author.

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