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OA by the article: an idea whose time has come

Authors want open access because it gives their articles greater impact. Scientific societies, whose dues-paying, voting members are the authors who want open access, are nonetheless reluctant to embrace it because of feared financial disaster. However, there is a risk-free, profitable means for these societies to move toward the universal open access that their members desire, without committing to a radical change in their cost-recovery model. They have only to offer their authors, for a fair price, the option of buying open access by the article.

This idea is an old one[1]. What is new is that publishers are implementing it and discovering that they profit from it and their authors welcome it. The Entomological Society of America, publisher of four major entomological journals, was first to sell OA by the article. ESA initiated its service in 2000 and has seen purchases increase from 25% of published articles in the first year to 62% in 2003. During this period, ESA's estimated annual net revenues from OA sales increased from $17,000 to $53,000[2]. Next to offer OA by the article was the American Society of Limnology and Oceanography. ASLO started the service for its principal journal in September 2001, and by 2003, 66% of authors were buying OA[3]. Within the past 10 months, three other well-established publishers have begun to sell OA by the article, with initial sales amounting to between 7 and 13% of articles published.[4,5]

If a publisher elects to sell OA by the article, how much should it charge? Both ESA and ASLO peg their charges to the prices of their paper reprints. Authors are familiar with paper reprints, and open access has a similar function but delivers it more efficiently. For example, ASLO found that its OA articles were downloaded, on average, more than 1200 times in the first two years. When ASLO compared usage of OA articles with those accessible only to subscribers, it discovered that for articles published in 2003, those with OA had been downloaded 2.8 times more often and that for articles published in 2002, OA downloads were 3.4 times more frequent[3]. These comparisons, and a concern that the service might become popular enough to reduce paid access to the entire contents of its journal, prompted ASLO to increase its price for OA in 2004. The new price was the cost of 500 reprints, whereas the old one was the cost of 100 reprints—an increase from $126 to $350 for articles of average length (10 pages). ESA has kept its price at 75% of the cost of 100 reprints, with the result that the price of open access for an article of average length (7 to 8 pages in ESA journals) has increased from $90 in 2000 to $124 in 2004. These prices are low enough to encourage authors to buy, which in turn has resulted in substantial net revenues as noted above. When ESA adopted free access by the article, the plan was to increase the price when the service became so popular that it might cause a drop in paid access to the full contents of issues. Thus far, this level of popularity seems distant.

The three publishers who have most recently initiated sales of OA by the article[4] charge a flat per-article fee ranging from $995 to $2,160. These fees seem unnecessarily high

based on the experiences of ESA and ASLO, which have found that about a third of authors are yet unwilling to pay even modest fees for open access. Fees of no more than $500 per article may, for the time being, be better for both publisher profits and author satisfaction. Fees can be raised if revenues from restricted access are threatened. In the interim, scientific societies have an opportunity to offer their authors a desired service at attractive prices.

Scientific societies can benefit in multiple ways by offering OA by the article. (1) They can substantially increase their publication revenues without loss of income from restricted access. (2) Their members are more likely to remain loyal because their societies' journals are offering a new mode of publication that many authors want. (3) Their members will be pleased that their societies are helping rather than resisting the move toward a better system of communicating research results. (4) Their journals will enjoy increased submissions because competing commercial journals do not offer an OA option. (4) Their journals will compete well with new journals that are fully OA, because their journals have well-established reputations and their OA charges can be less so long as they maintain some revenues from restricted access. (5) As OA gains momentum their journals will be well positioned to change to new revenue models.

Scientific societies that offer OA by the article can increase the value of their service by maximizing the convenience with which their OA articles can be found. For example, they should make sure that the indexing robots of search services such as Google and Yahoo have access to the files of their OA articles, and they should deposit all OA articles in an OAI-compliant archive[6].

Many scientific societies have helped the move toward open access by making all articles in their journals freely accessible after an embargo period of six months to several years. If the embargo period is brief, the societies might assume that they will not profit from offering OA by the article. Such an assumption is unjustified. Authors and their sponsors have already paid $19,500 to *Physiological Genomics* and $17,600 to *Development* for open access, in spite of the fact that these journals allow open access to all articles after one year and six months respectively.[7]

The lack of rapid adoption of "self-archiving," where the authors themselves make the contents of their refereed, published articles freely web accessible, suggests that most authors would prefer that publishers provide the open access and that it be to a publisher-formatted, publisher-authenticated version[8]. It is time for publishers to offer authors an OA option and to benefit from it.

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1. See *BioScience* 45: 171 (1996) (http://www.fcla.edu/FlaEnt/bioscivp.htm), *American Scientist* 86: 463-471 (1998), *Nature* 411: 521-522 (2001).

2. ESA (http://www.entsoc.org/) publishes *Annals of the Entomological Society of America*, *Journal of Economic Entomology*, *Environmental Entomology*, and *Journal of Medical Entomology*. History and statistics of its OA service is at http://csssrvr.entnem.ufl.edu/~walker/epub/esaepub.htm. Estimates of net revenues from OA assume that the incremental cost of offering the service is $1 per page.

3. ASLO (http://aslo.org/) made selected articles in *Limnology and Oceanography* open access starting in March 1999 but did not start sales of OA by the article until after it learned of ESA's service. Their OA service is described at http://aslo.org/lo/information/freeaccess.html.

4. The three publishers are American Physiological Society (*Physiological Genomics*), Company of Biologists (*Development*, *Journal of Cell Science*, *Journal of Experimental Biology*), and Hindawi Publishing Corporation (*EURASIP Journal of Applied Signal Processing*).

5. *Nucleic Acids Research*, published by Oxford University Press, recently completed an OA experiment in which 90% of the authors of a special issue elected to pay £300/$500 for OA. Based on these results, OUP plans additional experiments, which if successful, will allow the journal to "gradually move to an Open Access model" (http://www3.oup.co.uk/nar/special/14/default.html).

6. See the Open Archives Initiative at http://www.openarchives.org/ and Chuck Hamaker's posting to the *American Scientist* Open Access Forum at http://listserver.sigmaxi.org/sc/wa.exe?A2=ind04&L=american-scientist-open-access-forum&O=A&F=l&P=34583.

7. *Physiological Genomics*, published by the American Physiological Society, is the only journal offering OA by the article that does not clearly mark OA articles in online tables of contents. Beverly Ventura, Managing Editor, wrote (18 Mar 2004) that PG had sold access to 13 of 101 articles since the option was first offered, for $1500, in July 2003. Since January 2004, when Company of Biologists started selling OA by the article, *Development* sold access to 22 of 123 articles. During most of that period the service was offered for an introductory price of £500/$800. It is now £1350/$2160.

8. For information on self-archiving and its usage, see http://www.nature.com/nature/debates/e-access/Articles/harnad.html, http://www.eprints.org/self-faq/, and http://www.nature.com/nature/focus/accessdebate/4.html.

9. My interest in open access to the journal literature was initiated and has been sustained by the Executive Committee of the Florida Entomological Society, which embraced open access in 1993 and has provided it to all authors in its journal since 1994 (see http://www.fcla.edu/FlaEnt/).