

# Present & Future Threats to Journal Accessibility

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At first glance it would seem that the publishers have finally begun to hear us. To help cushion the blow of yet another year of price increases, they have supplied Faxon with information about the reasons for the increases. Look at the following table that I saw on the current Faxon web site.

## FAXON projects and explains journal price increases for 2001

Publisher located in:	North America	Continental Europe	U.K.	Other
<b>General Inflation</b>	2.5%	2.5%	2.5%	3.0%
<b>Publishing Factors</b>				
Paper	2.0%	2.0%	2.0%	2.0%
Postage	0.5%	0	0.2%	0
Page/Volume Increases	2.8%	3.4%	3.3%	3.0%
Cancellations	2.2%	3.5%	3.0%	2.0%
Currency	0	0 to -1%	0 to -1%	0 to -2%
<b>TOTAL</b>	10%	9.9 to 10.9%	10.0 to 11.0%	8.0 to 10.0%

The four columns of percentages each tell the same story, more or less, and combined, they amount to a confusing array of numbers. So, I will focus on the North American column. It will help us to see the picture more clearly.

## The North American table elements

<b>General Inflation</b>	<b>û</b>	2.5%
<b>Publishing Factors:</b>		
Paper	2.0%	
Postage	0.5%	
Page/Volume Increases	2.8%	
Cancellations	2.2%	
Currency	0	
<b>Subtotal</b>	<b>û</b>	7.5%
<b>TOTAL</b>	<b>û</b>	10%

When you see the table this way, it is not comforting at all. It is troubling.

**Red flag #1:**

Inflation is 2.5% and the price increase is 10%! That increase is four times the rate of inflation. How could that be? Answer: they adjusted the prices twice, once by using the general, standard inflation rate, the second time by breaking increases down to the itemized specifics of the product. No, no, no. Either you adjust prices by using the standard rate or else you itemize. You cannot do it both ways and add them together. It would be like computing your itemized deductions then adding them to the standard deduction when you do your income taxes. The IRS insists, reasonably, that you get to deduct one or the other, or else you get to go to Leavenworth.

**Red flag #2:**

If the standard inflation rate is only 2.5%, then why is the itemized inflation 7.5% — *i.e.*, three times as high? Because the itemized inflation rate is full of mistakes and shell games.

- The increases for individual items cannot be added up the way they do. Consider the paper cost for example. If paper goes up 2%, that does not mean prices go up 2%. Paper costs are a small fraction of total costs. At EER, for example, paper costs are less than 6.2% of production costs. So only that 6.2% goes up at the inflation rate of paper. 2% of 6.2% is only 0.124% ( $0.02 \times 0.062 = 0.00124$ )! That is all, 124/1000 of a single percent.

Same with postage. Our postage is less than 2.5% of our production costs. 0.5% of 2.5% is only 0.012% ( $0.005 \times 0.025 = 0.00012$ ), or 12/1000 of a single percent. Thus, the true contribution of paper and postage inflation is pretty microscopic. It is 0.136%, a little more than a tenth of a percent. That is such an incredibly tiny amount. For a whole year, it is less than \$71. NOT \$71 per subscription, but \$71 for the entire press run including all eight issues and all copies.

- Most of production costs go to expert labor — copyeditors and typesetters and printers and accountants and lawyers. All agree on this fact but none of these costs appear in the table. Why are they left out? Have some publishers perhaps ever reduced the compensation or benefits of their copyeditors and typesetters and printers without reducing journal prices?
- When a library cancels a subscription today, it is generally because journals are too expensive already. How do you justify a remedy like charging your remaining customers even higher prices? Why not listen to the message and lower your prices? Of course, that assumes that you care about access.
- Finally, suppose we were to play their game by their rules. Then we would say that a 2.2% loss of subscribers obviously means a 2.2% saving in paper costs and mailing. So the 2.2% should be *subtracted from* (not added to) the 2.8% increase due to more pages. That would leave only a 0.6% net increase from these two factors. In the table, they add the factors and arrive at 5%. But of course, both the 0.6% and the 5% are garbage figures produced by flailing math and flawed analysis.

It is easy to do the process correctly, so why didn't they? Here's my guess.

I once knew a geneticist with a good sized federal research grant up for renewal. After he sent his proposal off to moneyville, I asked him how he reckoned the budget. I always find such things difficult. But he did not. He told me that was the easiest part. He just estimated his likely grant size based on what the agency had been giving in the recent past and what he had been getting before. Then he made up numbers that summed to his guesstimate. It was fiction, but he did do fine genetics, so no one ever cared.

Anyhow, that's what I think is really behind the numbers that we see from publishers. They estimate how much we will be willing to pay, and they charge it. Marketers call it value pricing.

Once the new prices are announced, the publishers monitor the howling and the scratching. If we do not howl or scratch at all, they decide they did not charge enough. If we claw them good, they back off a bit next year. They recognize absolutely no obligation to give a true accounting to their customers, only to their stockholders. Their explanations are designed merely to soften us up for a bigger hit.

But we should expect nothing else. That is the way value-pricing works. The question is not

whether big commercial publishers are doing competent value-pricing. The question is whether value-pricing is at all ethical in this case. Is it fair in light of the trust academic authors place in their publishers to get the word out? Is it fair in light of the virtual information monopoly represented by each and every scientific paper? Is it fair in light of the fact that society needs that information and has in large measure already paid for it with salaries and facilities and grants?

Our answer at EER is a flat no. Our editorial board walked away from value pricing when it founded our journal.

### History of EER

EER reduced subscription prices to libraries by 62% (305/800) compared to what ITC charged for EE in 1998. Scientist-clients of subscribing libraries do even better; they get the journal for our marginal cost: \$29 plus postage!

- Authors support it.
- SPARC proclaims it.

EER lost a tiny amount of \$\$ in 1999 and is making a tiny amount in 2000. Clearly, as the European, Japanese and Australian libraries discover us, we will become a small, reasonable financial success.

EER published over 1000 pages in eight numbers in 1999.

EER has already published 700 pages in five numbers in 2000, and will publish over 1050 pages in eight numbers in 2000. We have already begun copyediting the set of papers for issues 6 & 7. Issue 8 is about half accumulated, as well, and we will begin copyediting it soon.

EER's papers are good, extremely good. Thanks to its authors and editors.

EER did not raise its prices for its second volume and hopes to keep them the same for its third.

But EER has done more than re-establish the point that an academic journal of fine quality should be and can be available at a reasonable cost. EER has innovated in two areas of particular concern to you: property rights and use of the internet. We must not ever forget pricing; it will always be a fundamental issue controlling access. If we forget that, none of the rest will matter. Nevertheless, today I want to focus on property rights and use of the internet.

Access to information in most journals now depends on payment beyond that collected for subscriptions. To use an article in the classroom, publishers charge so much per copy. EER

thinks that scheme obscene. Remember, the work done for a paper is generally supported by public grants, the scholarship to prepare it for the press is also supported by the public. The authors donate their efforts for several reasons: they want professional advancement, they want to remain competitive for those grants so that they can continue to do their scientific work, and they want others to learn from their research. They certainly do not want its dissemination impeded by high prices and subsidiary charges to students. Show me a publisher who actually depends on the sale of xeroxing rights to make its profit, and then I'll have seen one that is not greedy. But for most publishers, such subsidiary income is just more cream added to their bowls — the bowls of cats — How shall I put it? — cats that could stand to lose a little weight. Meanwhile, for the rest of us, it is salt on our wounds, and insult-to-our-injury. It restricts access.

So EER does not take its authors' copyrights. It asks merely for a one-year exclusive license to publish and distribute their works. And it asks authors to agree in writing that they will not charge anyone for non-commercial use of their papers. Authors are surprised, but delighted to do it.

EER does not even sell reprints. It gives authors professionally typeset pdf files of their papers so that they may distribute reprints electronically or print them up as demand requires.

Which leads to our use of information technology. First, let me tell you what we are not. We are not a cutting-edge innovator of methods or design. Go on our web page and you will see a competent but quite prissy display. No flashing icons. No zippy graphics. No fancy drop-down menus. We have not yet implemented electronic submission or XML. Nor have we hyperlinked the references in our papers, or produced much of an indexing capability.

I will not promise never to do these things. In fact, I have a lot of applets in my eye. I see a journal whose internet version includes author-written software that readers can try on their own data sets. Using time and color to expand the dimensionality of the printed page, I see animated mathematical theories. I see movielets of courting, displaying fishes and hear the WAV-files of exotic bird calls. But we have not done any of this yet. So, where have we innovated? In our internet policies.

- I believe we were the first journal with a print version to allow a library to subscribe to our internet version without buying a print copy.
- We may yet be the only journal to give its authors electronic copies of both the screen- and the press-optimized copies of their published work. The files are suitable for a Docutech printer or for distribution on our authors' own home pages.
- We may also have been the first journal to post *preprint* editions of forthcoming works on its official web site. These are editions on which our editors have worked, but which have not yet enjoyed the good services of our copy-editor or typesetter. This policy

brings peer-reviewed, author-revised, journal-approved information to readers approximately six to eight months before they would otherwise have it.

I must admit that when we began, I thought we would have to wait a year or two before plunging into the world of the internet. Then I found a superb typesetter that would output its work to me as PDFs. No problem, I thought. Piece of cake. In fact I was a fool!

The fun began when I quickly discovered that the world of the internet was full of charlatans out to make a killing. What would you like? they asked. Oh, just this and that, I said. That's all? said they. No problem, said they. Right! I soon found out they were speaking about the ISP they wished they were. The truth was they hired high school students as part-time programmers (I am not making this up) and had not the faintest idea of what they were promising. Except, they did know it would cost me plenty.

Fortunately, scientists these days are not exactly unprepared to face the world of computers. One by one, I went through the phoney until, four months later, I had a fully competent gem of an ISP.

And the licensing! More fun! What a delight! Nothing gives me greater pleasure than negotiating with a lawyer when I have already freely and willingly given away all the lawyer usually has to fight to pry out of a publisher! There's no way for the lawyer to look like it deserves a salary. So, it gets in the way big time. Did I say it? Well I am simply trying to avoid sexist language here. As Stephen Wright said, 99% of lawyers give the rest a bad name. Lawyers have added whole pages of construction industry boilerplate to our licenses. We have to deliver the goods on the doorstep of such and such a building. (Remember, I am talking about the internet version.) Our workers cannot use drugs. We will be paid by the issue and then only 60 days after delivery. (I am still talking about the internet version.) And, of course, we are responsible for any Y2K glitches. But we survived even the lawyers.

So, what is our problem? Archiving. Here's my favorite prop. Recognize it? No, it is not a 5.25" floppy; it is an 8" floppy! And the hardware is a small part of our problem. Hardware problems don't amount to much. We can rather quickly transfer the bitstream of one medium to another newer one that appears likely to replace it. And faster, more powerful machines will always be able to run our old software — in theory.

In practice, legacy software soon gets abandoned for more elegant, adept and versatile programs. Then the engineers stop incorporating the ability to run the legacy software in their new operating systems. Do you have any old WordStar files you would like to translate? I bought my current wordprocessor in part because it is the last remaining modern wordprocessor that can read WordStar files without a hitch.

EER files appear as pdf files. I do not know how many of you have ever looked at the bytes in a pdf file. Pdf is a code for a machine to read, not a person. What will happen to our files when Adobe — heaven forbid — goes under, or stops finding it profitable to empower its new software to read the legacy files of the last decade, or year, or day?

Don't worry, say the value-adder publishers. We'll take care of you. We bring stability and permanence to the world of information. Sure. And the best thing for all libraries is to be built on the San Andreas fault.

You want to know what's permanent? The following rule is permanent. All publishing houses are ephemeral. That will always be true. Virtually all the glorious, storied, courageous, pioneering commercial publishers of my youth have gone under, or they have morphed into conglomerates with the ethical sensibilities of a pencil and the literary standards of a Walmart. Or else they have been absorbed by such conglomerates. Another fixed point on the publishing compass: they are none of them in the business of charity; they cannot, cannot, maintain an archive if it should get too costly. Eventually, they will cut and run if we trust them. Bank on it.

In the western world, only one institution lives to keep knowledge alive. The library. The library has been civilization's archive for four millenia; it is not wrong to count the destruction of the great library at Alexandria as the principal intellectual disaster of classical times. It is not wrong to count the discoveries of the royal and sacred cuneiform libraries at Nineveh, Ugarit, Ebla, Nippur, Assur and other ancient near-Eastern capitals as basic intellectual triumphs of modern archeology. The library has always cared about preserving knowledge and culture. It must be the place to look for the answers to today's archiving challenges.

There are two challenges: coding and reliability. The coding problem is daunting, so it is lucky that the reliability problem is trivial.

Recently, the office of Pope John Paul II informed us that the third revelation of Our Lady of Fatima predicted his near-death by gunfire twenty years ago. Those with faith in the Holy See find that report entirely reliable. Others are more dubious about a prediction published the best part of a century after it was made and almost a generation after it was corroborated by real events. If the prediction had first been archived with five or ten disinterested libraries, no one would doubt its reliability.

Similarly, e-papers are too easy to change as an author's interests require changes.

- Make a mistake? No problem. If you change the e-record of your results/conclusion/prediction, you never made the mistake!
- Take a political position that has since become unpopular? No problem. Just massage the electronic version that you keep under your control. Down the memory hole!

As soon as the reliability problem is set down, its answer pops up. E-papers must be archived in multiple libraries out of the control of those with a self-interest in what they say. The archives must each stand alone, not be connected to the net, not be hackable remotely. Until it is so archived, no e-paper should be deemed published. Period.

We biologists have a venerable model for such rigidity. When a new taxonomic entity such as a species is discovered, it is described and named in print. But if too few copies of the publication are available, the description and naming are set aside as irrelevant, the publication viewed as if it never happened. We will know electronic archiving has matured and succeeded when taxonomists allow new species to be described in e-only publications!

The coding challenge is inherently more difficult. To solve it, librarians in combination with authors and engineers will have to create a choke-point. You want to publish your work as an accepted e-piece? Fine, here are the coding formats we accept. You want to sell us an e-journal? Fine, publish it in one of these codes.

In a disorganized way, publishers are already doing this. We accept papers and graphics in a restricted set of file codes. But, as our authors upgrade their software, we keep changing what those file codes are. We make no attempt to stabilize them. WordPerfect 9 replaces 5.5; Word 98 replaces 6. TIF files change from version to version and graphs done with older versions have become gibberish. And now we are even faced with files preadjusted to various languages. Ever try to read an English file produced by your very wordprocessor, but by a colleague working on a machine in Japan? It is not always trivial.

One proposed solution involves ASCII code. The ASCII table of byte values has been stable for more than two decades. Just make all authors code in ASCII as well as the fancier program of their choice. Then if the fancy code gets lost, at least the text will be preserved.

Not good enough. It is the right idea, but it gives up on equations and graphics. We archive these now (with ink and paper). What sort of advance is it if our new technology makes us step backwards?

But it is the right idea. ASCII code is stable because a group of technologists got together to fix it. Low ASCII is like a rock. (And, because it is not fixed, high ASCII is almost useless for archiving. ASCII has a version; ANSI another; and every country uses a variety of high ASCII symbol sets.) Similarly, mathematicians banded together to promulgate TEX, the tagged-file code that lets them publish equations electronically. And there is HTML. We would have no internet without it.

If you are not convinced, think about the intelligence services. Very early on they learned that



if they did not want their messages to be easy to decipher, they should change codes as often as possible. So if we want our work to be inaccessible to the future, we should put each paper into an obscure computer code that can be read for only a brief time by a only small number of specially equipped machines. Sounds just like what we are now doing, doesn't it?

Make no mistake. There is a cost to be paid here. Fixing codes will slow the rate at which software evolves. Adding a code will be a tough sell. The organization that fixes the code list will have to be convinced that the new code allows something substantive, something that was impossible previously and is worth its extra cost. It won't do to show that a software improvement merely does something faster or more elegantly or even more conveniently.

This should hardly embarrass us. Just realize that the space agency, NASA, has yet to use the first generation Pentium chip in any of its interplanetary explorers. Space exploration is dreadfully expensive and NASA resolutely demands reliability, you see. They have just reached the point where they are willing to rely on a 486 chip. All that moon exploration, all those shots of Mars and Jupiter and Saturn, all those high powered rocket scientists, and they never used better than a 386 before!

But today we allow software codes to change at a speed that threatens the usefulness, accessibility and permanence of everything we write. We are not talking about advertising circulars here. Do we really want to endorse a culture predicated on the assumption that anything more than five or ten years old is not worth reading?

I envision a system in which authors will encode their work with one of a small number of fixed, well-defined wordprocessors and graphics languages. To qualify for the list of these programs, their manufacturers will have to agree to make their source codes available to libraries, and to allow libraries to transfer them to new operating systems as required. They might be compensated by a fee based on usage. But if that does not work, then libraries should put their shoulders into a public project to develop their own codes.

Of course, no standard library code will last forever. But greatly reducing the number of codes and the rate at which libraries permit them to change will enable libraries to handle the burden of upgrading documents from old to new codes. Trying to do so today would overwhelm their resources.