

University Faculty Forum
Open Access Scholarly Publishing: Opportunities and Obstacles
December 11, 2002

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J. Robert Cooke, Dean of Faculty:

“Undoubtedly we will have additional individuals joining us, but I want to protect jealously the time we have for this conversation for a university-wide discussion on scholarly publishing. Let me quickly comment on the procedures. We have seven senior editors, members of the Cornell community, who are going to make presentations of seven minutes each. That will be followed by the last half of the session, an hour of discussion in which you will have an opportunity to offer points of view, contrary if you wish, and to ask questions of the panel members. We will adjourn promptly at 3:30 and we will pace ourselves accordingly.

“I do want to alert you that we are making an audio recording of the discussion as we always do for things of this sort and that verbatim transcript will be appear on the University Faculty website for the benefit of those who couldn't be here today but still may be interested in what we are discussing. Throughout the conversation I would request that you identify yourself before speaking and I will set the example by introducing myself. I am Bob Cooke, Dean of the University Faculty and I would also like to start with 2 additional introductions, Kenneth King and Ross Atkinson. Ken is the former Vice Provost for Computing here at Cornell and subsequently president of EDUCOM, the higher education primary group for academic computing. Ross is an associate university librarian. And there is a larger group working with us as well.

“The presentation that I am going to make comes in two parts. ([Overheads- Cooke](#)). The first is that we will talk briefly about the implementation of a digital archive at Cornell. It is one that was created by the library at MIT and for which we have funding to implement here at Cornell. That opens up some interesting possibilities of new kinds of services that the library will be able to provide to the community.

“The second part, which is likely to engender more conversation, is focusing on the theme of how to create open access, internet-first publishing. Meaning how can we create a paradigm shift such that all the primary scholarship out of higher education is immediately available to you without royalty on the internet and still have the same kind of standards for peer review that we have come to depend upon with the printed vehicle.

“Let me make a few observations of a general nature. Surely everyone in this room is aware that we have a crisis in scholarly publishing. I think it basically has three components to it. The first is that the number of people that are active in higher education has gone up dramatically with time and in some general sense the body of knowledge that we accumulate is doubling at the rate of about every 12 to 14 years. If you spend anytime thinking about exponential phenomena you realize that as you go further down that curve a doubling is of much more consequence than it was earlier. To give you a sense of scale, at Cornell University alone, we add about 3 new miles of shelf space every year. That is material that is stored in perpetuity, air conditioned forever. So that storing and operating the way we have been operating is now at risk for financial reasons. You surely have heard about spiraling subscription prices and especially fed by the commercial sector.

“Third, we are caught in a paradigm shift. That is we have been based on paper since Gutenberg's day and we still need to maintain paper records. The digital is developing rapidly but we don't yet trust it to serve all of our needs. So the library and the university in general are caught in a bind so that any new thing added in the digital format almost invariably, although we are trying now to make a break from that, almost always means duplicate materials. So, it inherently increases our costs instead of decreasing out costs and the hope is that technology will eventually reach the point where it actually decreases our costs and improves the service.

“One of the premises for getting through that transition is if in fact you can separate the content from the paper and store it digitally and retrieve and convert it back into paper when you need it to be in paper that the storage cost will be dramatically reduced. So it means not necessarily giving up having paper but not having it until you need it to be printed in paper. There are also some opportunities for storing new materials that we are not now emphasizing, multi-media whether it is photographs, electron microscope, audio recordings, bird sound recordings, motion picture - a new class that the digital world offers promise of helping us meet the needs of the faculty more effectively.

“The responses have been both short-term and long-term and what we are doing today is to try to shift the focus from the short term and pay more attention to the long term. The libraries on our behalf have struggled with this issue for decades, literally and it appears, at least to me, that the time has come for the faculty to join in as a real partner in that process and for us to consider some longer-term issues.

“Our dilemma is that we have out-sourced our publishing and it is now coming back to haunt us because when we transfer the ownership to a third party they have the right to set the price we pay to get it back after they have added value to it. We believe that we have a one-time opportunity now with this transition to try to reclaim control of this. At least those of us involved in the project that has been funded is that our strategic intent is to rather than continuing to engage in the publishers in a ‘food fight’ over control is that the universities ought to assert ownership and find a way to reclaim it so that the publishers then bargain with us to get their control and not vice versa. It is a much more interesting strategic situation for the university to retain some kind of ability to control it and much of the conversation this afternoon will have to do with how we might achieve that. The main theme is that this means one alternative is for the universities to simply fund the productive output of scholarship of the faculty and staff and do it up front and make it available to the whole world free. The Dspace archive recently released by MIT is being tested and implemented now at a small number of institutions, Cornell, MIT, Columbia, Toronto, Rochester, Ohio State, University of Washington and Oxford University. So, we are going to be getting some experience from other campuses. The Dspace is the archive part and it is concerned with storing materials including raw data, working papers and many things that would not normally be considered publishable, but to share them in a way that can be retrieved and that can be shared with other scholars. There are other experiments going on as well but we are using implementing Dspace and these will be some that we will be interested in working with. That group will form a federation so that we eventually build a system that has each university having its own server but it would all be tied together so the user would see it as one entity and not a collection.

“The advantage of open access is that it would enable worldwide access and local access too. Certainly in my classroom the students already are attracted to being able to read things online and have some strong preferences for doing that over having to go a physical building to get the material. It improves research and teaching productivity because we need to be able to have the accumulated wisdom in order to build on it and we need to have it readily available and not encumbered by huge financial costs that are disruptive or the time delays that that implies.

“We are proposing to allow viewing on the screen by any individual without a royalty and furthermore to be able to make a printed copy locally, a single printed copy. If there were need for mass production then it would be turned into a commodity and then there would be some royalty considerations involved and some licensing involved. And the fourth one is that it broadens the scope of the materials that can be routinely handled by the library on our behalf.

“The final piece is some important challenges that we have identified as requiring some serious thought if this is to happen. The first is that we have to make this paradigm compatible with the current reward structure. It is not reasonable to ask faculty to participate in something that is not going to be given proper recognition along with other things. I would claim that the transition to digital has to be voluntary. No one would publish there unless they wished to do so but clearly the institution has a need to move in this direction. The tenured faculty are the ones that have the job security and have the capacity to take the risk in this transition period to begin publishing in some untested ways. Tenure should be based on the quality of the scholarship not upon the particular vehicle used to distribute it. I would say with some bit of cynicism, contrary to our copyright policy which is based on how it is actually implemented.

“Peer review that is independent of the distribution vehicle. We do need a system for branding to aid the reader, to identify the material that really is worth reading and to provide peer recognition for the authors because we are all paid indirectly. We need to generate some new quality control mechanisms. The Internet, historically as short history that it is, has not emphasized peer review but it is material that generally does not have a guaranteed lifespan, nor

does it come with a guarantee that it has been checked for accuracy. We need to do that in order to be able to trust this literature. So the review process could in fact be the same as we do it now but having it on the Internet has at least a couple of possibilities and that is based upon the fact that you can post something and then review it afterwards. When you print it, it is fixed and therefore the peer review has to occur before it is posted.

“Here are some ways in which the Internet allows new possibilities. One would be to commission the professional societies to handle the vetting. Once the materials are paid for and edited and put on the server in this federated system, commission the professional societies to look at it and identify individual articles that are relevant to that particular membership and of appropriate quality. So we will still depend upon the professional societies as the ones that are doing the gate keeping on quality. It also means that you can have the same article being included in multiple tables of contents without the cost of actually publishing it twice.

“The second one would be that you could have peer review of indefinite duration instead of over the course of a few months. If it were posted on the website and if you added a system so you automatically link the articles forward in time, so if you submit article, have software that will extract the references from that article, put look up tables in all the articles you referenced so that if someone starts into the literature search at one of those earlier articles, you are immediately vectored to the more recent material. In effect you would have indefinite duration peer review. If you write about cold fusion the chances of your being found out are pretty good.

“We need to find a way to interact with the professional societies because they play an important role. Some of them have used their publications as a source of income and so that really does present a challenge for us to figure out how we can collaborate. The last one is that we must assure long-time archival support. The Cornell Library has agreed to take that on and will maintain and refresh the media and will be able to give you back what you have put in storage. There are other problems of course; the formats will change over time. That is a different one. But at least they can give you back the bit stream that is given to them.

“Let me now switch to the speakers. Let me have you raise your hand and I will let you stay where you are now until you are speaking and then in the discussion session I will ask all seven to come to the front to be able to take your questions. Paul Ginsparg, Eberhard Bodenschaetz, John Rowehl, Jeff Rusten, Keith Dennis, Joe Halpern and Karl Niklas. That is the speaking order. I will begin by calling on Paul and reminding all of the speakers that they have seven minutes before being interrupted.”

Paul Ginsparg, Professor, Physics and Computing and Information Science: “I will try to be brief here and provide the context for those elements of the arXiv related to today's forum. (Appendix PG-1- front page [<http://arXiv.org/>](http://arXiv.org/)) This is a system that started in 1991, and is now hosted by the Cornell Library in the Digital Library and Information Technologies Group (D-LIT). We have some members of the group here in the audience. It is largely an automated system, and doesn't include any of the peer review components that Bob mentioned. But there are some aspects of the community it serves that might generalize to others, and I'll try to discuss those here. On the other hand, I'll also want to mention some elements that are very different. One of those is that this is a community that had already moved much of its communication to the Internet in the 1980s before much of the rest of the world had discovered it. So back in 1991, people were more or less champing at the bit, waiting for electronic resources like this one.

“Here is a graph of the submission rate (Appendix PG-2, http://arXiv.org/show_monthly_submissions), starting from the beginning in 1991. In this graph (Appendix PG-3, http://arXiv.org/Stats/hca_avg.gif), I've separated out the fast growing components. The blue is the sub-community of physics in which it started, high energy physics, and the green and red are two other communities, to illustrate how even though sometimes they seem to start slowly, eventually people might start submitting at a high rate. The aggregate usage in 2002 is probably going to be about 36,000 new submissions per year, covering many of the fields I had on the first transparency. To set the scale, the total number of articles in physics is estimated to be on the order of 50,000 to 100,000 per year, depending on how you define physics. So we already have a substantial fraction of the global physics output. For another comparison, the American Physical Society, the largest single publisher in physics, publishes about 14,000 articles per year. Finally, the participating community in this case is really all electronic: heavy users of the system operate on the basis that if something isn't there and available electronically, it might as well not exist.

”Another very critical aspect of this community, and I think this is fairly typical of academic communities, is how international it is. Here's a graphic produced by the New York Times based on information that I gave them in May 2001 (copyright prevents posting, see instead http://arXiv.org/Stats/au_all.html) Appendix PG-4). The gray areas are places that were accessing the system and the circles show the contributions from various countries. There's a heavy concentration of submissions from Western Europe and the US. But it is really distributed from all over. The places from which there were no accesses back in spring 2001 are places like Afghanistan, Yemen, and Iraq. So there is even some significant political signal in some of the usage data.

“Since this system started in '91 before the World Wide Web, and before journals had come online in any significant way, we can ask what happened starting in the mid-90's when the journals did start coming on line? What was the effect on a system like this which runs in parallel to peer review, but in advance of it? Here is a graph of the usage data (<http://arXiv.org/blurb/dl9601.gif>) Appendix PG-5) from the main site from '96 to '02 (full text retrievals) and you see that the usage actually accelerated during that period, so that in 2002 we're anticipating about 20,000,000 full text downloads globally of the material. The gaps you see occurring every year are between Christmas and New Years' when people are either unable or unwilling to access the internet.

“For anyone curious how this looks on a per article basis, here (<http://arXiv.org/blurb/hep-th.hist.gif>) Appendix PG-6) is the number of retrievals of the articles from a typical archive and you see it's a log-normal distribution. It has tail in which some of the articles are accessed in the tens of thousands of times in the six year period '96-'01.

“The last thing I'd like to discuss is some of the cost issues. As I mentioned, this is a system that operates in what in principle is a fully automated mode. In practice, because one needs a certain amount of help-desk and other administrative activity, some labor is needed. Still, as we will see, it is very cost effective for the volume of submissions we are handling with a small staff of roughly two part-time people in the D-LIT group. The volume is much larger than any typical journal, in fact much larger than even the largest of the journals.

“To set the scale, the graph (<http://arXiv.org/blurb/rpa.ps.gif>) Appendix PG-7) starts with an estimate of the nominal average research cost of \$50,000 per article. This comes from considering salary and overhead for a single person, assuming this person writes an average of three to four articles per year. Of course it can be much higher if you include the costs of experimental equipment and all the rest.

“One of the recent discussions of the Cornell library board, on which I serve, has been regarding the high cost of many journal subscriptions. The transparency we're looking at I made almost two years ago with some estimates of the revenues of some of the higher-cost journals in Physics. These lower bound estimates computed for commercial operations are made by multiplying their known annual subscription costs by some minimal estimate (say about 100 or 200) of big institutional subscribers in order for the journals to be viable, and then dividing by the known number of articles per year. For some journals it comes out to about \$10,000 to \$20,000 per article in revenue, quite shocking to most researchers since they never consider the issue. They are not aware that there is that kind of money in the system because they are largely shielded from it, and the money is not fungible: if the library cancels the journals it is not as though that money makes it way back into the department for people to use to hire students or buy computer equipment.

“The estimates of the aggregate average publisher revenue, again in the sciences, is on the order of \$4,000 to \$5,000 per article. This comes from the estimate of about 2 million STM articles per year and about \$8 billion in publishing revenue. The ones who bring the average down from the "high-end" (i.e., in cost rather than services, which are all roughly equivalent) journals considered above are the non-profits. I'm also on the publication oversight committee of the American Physical Society and their public data is about \$28 million per year in revenue to publish about 14,000 articles, so it is about \$2000 per article, and there is not a lot of leeway in these lower cost operations for the sorts of savings that Bob Cooke described. Some of that money goes into editing but a lot of it is just the cost of administering peer review. Unless one is prepared to modify peer review, which I won't have time to talk about here, there isn't a lot of money to be saved from that \$2000/article cost (see instead., e.g., <http://arXiv.org/blurb/pg02pr.html>). By abandoning print, and making use of other electronic efficiencies perhaps the cost of administering peer-reviewed publication could be brought down closer to \$1000/article. So that is an obvious but important point that I will have to save for the discussion session. If one wants to move in the direction of reforming the scholarly publishing enterprise, there has to be a way of continuing to move money to the people who

organize the quality control.

“One could observe ‘Well, these are the established publishers, but perhaps the revenue of non-profit start-ups could be a little lower since they are not faced with all the legacy problems (of continuing to support their prior infrastructure).’ But again, the cost for administering peer review for these startups still comes out toward the \$1000/article range. The ones currently in there at around \$500/article will probably move up towards \$1000 once they lose the initial idealistic rush of volunteer labor and enthusiasm, and costs are properly accounted.

“Finally, towards the bottom of the graph I've estimated the cost per article for the arXiv operation in the \$1-\$5/article range. This might be a little low currently, but the important point of this graph is to say that a system without the peer review, just a pure distribution system more akin to the institutional repositories we're discussing here, the cost comes down by a factor of 100 or 1000. The uncertainty is based on the precise level of services provided in addition to the raw distribution.

“Some of the things I don't have time to discuss and I will defer to the discussion period involve the problems facing institutional repositories which might impede this level of growth and usage, and also what should be the inter-relationship between institutional repositories like the one proposed for Cornell and this sort of disciplinary aggregation.”

A more complete version of a related talk is available at <http://arxiv.org/blurb/pg01unesco.html>

Eberhard Bodenschatz, Associate Professor, Physics and Chair of the University Library Board: “Thank you for coming. It is a pleasure to see so many people here. I will try to be short. We have already talked about – that obviously there is a problem. I gave a presentation here to the Senate about a month ago and there really is a problem that we are paying more and more and more to the publishers and we are not getting any more for it. It is just getting more and more expensive and the revenue that the publishers try to get out of us is way above inflation. Since we are limited how much money comes in the bottom side, it is really hard just to keep up and what we will see in the future is that things like ScienceDirect or the Elsevier subscription probably within the next year for paper will disappear because we just can't afford it. At least, this is what the Library Board is right now discussing heavily and is thinking about it. The question is of course is there a problem and sure there is a problem, things seem to be too expensive. Right now we can't keep the status quo that we are used to and made us very comfortable because the Library just cannot afford to keep these subscription. Then what do you do? I have been interested in this for quite a while. I am an editor for Physica D, which is an Elsevier journal, and I was an editor for New Journal of Physics which is the exact opposite of that, as you will see in a moment. So what I did, I got active on my editorial board for Physica D and what I found out is that not all editors agree that this is a problem. Actually some came back to me saying why are you even bringing this up, everything is perfect and the market will decide. So there are some editors who feel just let the market decide what is going on and for me as an editor this is not an option because why would I do the service for the journal which might be dead in two years. So for me it is a very important question whether authors will read my papers that I review and publish.

“Some authors actually have stopped submitting to us anymore, this is for Physical D. Very few referees have refused to review papers. So far all of my referees continue to review my papers without saying a word. Some other editors told me they have received letters from referees saying no, no you are just too expensive and I don't want to review for you. It is not really a problem for the editors yet. The editors can stay very well and then the question is, we had this very interesting presentation a while ago and what I took from that was ‘what is in it for the editors?’ and what you realize is that the editors have an interesting thing. Once you are the main editor of a journal you are actually quite recognized, you have quite a bit of power. You can say this is the direction this journal should take so you are very powerful. The other thing is that you get a little recognition at being an editor. You go to conferences, people know you are the editor and of course depending on the journal you have income. Depending on the journal you might have quite a decent income and then you have created this conflict of interest. On one side you are for your subscribers and on the other side it is nice to get a few thousand dollars on the side and to actually get that income. So you have this conflict of interest and the question is how do you get out of it? An alternative, we have already discussed this, you could pay up front so you could make it free for all, For example you could have a journal that just pays for the refereeing process which I think everyone agrees is extremely important to have. The refereeing makes the paper very valuable which I see as an editor quite a bit, a lot of papers can actually really change due to

the refereed reports. It is not like it is just a stamp of approval; it is not at all, at least not with the ones that I get. Then the libraries do the archiving. You can even make contracts with the libraries or the libraries just out there and pick it up because they like to archive things and make them available to the whole community. The other possibility is to go to the publisher and discuss with them and say 'why don't you decrease how much money you make.' They won't react to that at all. The third one is, what about using some of the income to organize meetings or other things. Now that is something the publishers actually like because what that means is advertisement for the journal. If my journal can give to a conference \$50,000 to run the conference and invite speakers and it says supported by Physical D well that is advertisement and so that guarantees income so this is a clever way that publishers can use us to funnel money back to us but that doesn't mean the journals get cheaper. It just means that the money comes back to us in another way, which again increases the power of the editor, which makes the editor more famous and increases the conflict of interest.

"So I made a comparison. A while ago I went to the library to find out what we actually pay? What is published out there? What will each article cost? Some of you take Physical Review-e. This is the impact factor which you can just look up on the web and this is the price in dollars for one subscription posted on the web and this is the number of articles and if you just divide these numbers you come out roughly about \$1.00 for Physical D per article the library right now would pay for each article they receive every year. Then what you can do is to take a journal that competes with Physical D, like Chaos and you find it has a higher impact factor. It is twice as expensive as Physical D. And then if you go to Physical D and then it depends, if you take the print subscription only the published price you come up with \$40.20 per article or if you look at what roughly everybody seems to pay for download. So you take a lump sum at the beginning, so the first article is very expensive that you download and all the others are free or you can also say why don't we just wait a year and see how many articles we did download and then divide that number and it turns out right now typically we pay to ScienceDirect per paper that we download between \$8.00 and \$12.00, something in that range. So every time you go to ScienceDirect you click, you have just decreased the value actually because the first one is incredibly high, it is over \$1.5 million or something like that and from then on it gets really cheaper. And then what you can do is you can use nonlinearity and you notice that this is \$13 so there are cheaper ones out there. \$33.75, of course that is one of the weaker journals, you can tell by 20 articles published per year, but on the other hand the impact factor is not very large.

"What I want to do is talk about the New Journal of Physics that was founded about four years ago as an alternative to the current publishing scheme and what they do is charge \$500 roughly per submission. So when you submit an article to the Journal you pay \$500 up front for referee charges and posting charges and from then on it is free. My estimate right now when I take the number of downloads the price comes out between \$.50 and \$2.00 depending on how you count downloads, but it was surprising to me. Now this is the start-up, but it is not that much different actually from this up here. The difference is everybody in the world can read this article. This is why Dspace would be so wonderful to have.

"Let me just jump along. We were asked to look at the copyright statement. I tried this morning to find the one for Physical D. I could not. I was unable to retrieve my own copyright statement. "The only possibility was that I would have had to submit a paper to myself and then it would have popped up. Here is the one for the New Journal of Physics. This is what it says, 'You can post and uplink the work on most publisher servers as long as access is for non-profit.' You can post this paper as long as you want on any server in the world as long as they make a reference that this paper was published in New Journal of Physics. Otherwise it is totally free and you can post it on any server in the world. I like this copyright statement very much. It gives total freedom to everybody.

"This is pretty much what I wanted to say and I think I am just within my seven minutes. I look forward to the discussion and the questions."

John Rowehl, Editor, Philosophical Review: "I am here to present the perspective of the publisher, which feels like a dangerous thing to do in this room at the moment. We are a fairly simple case, one that illustrates both the appeal of Bob's vision and its potential to work in at least some cases. The Philosophical Review has been published continuously by Cornell since 1892. It is edited by faculty in the Philosophy Department here with occasional assistance from external referees. We publish three to five percent of submissions we receive, or about 12 substantive articles per year. All submissions undergo blind review. We also commission and publish approximately 100 book reviews per year. Philosophical Review has quite a good reputation as one of the top journals in the field and as a

result publishing in the Review certainly helps one's tenure case. In other words, we are your garden-variety top-notch academic journal."

"As publishers go we are one of the good guys. Indeed, in many ways we are just a paper-based analogue of the sort of online publishing model that Bob would like academia to adopt. We are published by a university. We are not free (because our production costs aren't zero) but our subscription prices are quite modest, especially compared to some of the figures we just saw -- \$60/year for institutions, \$36 for individuals, \$22 for students. We set our prices only to cover our expenses, not to make a profit. We have copyright practices that are quite friendly to authors and to educational uses. We don't even charge fees for reprinting. We allow our authors to charge fees for commercial uses if they want but not for educational uses. There are other benefits to our being here at Cornell. Olin gets a complimentary subscription of the Review. Through our journal exchange program, Olin gets subscriptions to some 165 other philosophy journals for free and subscriptions to 53 additional journals in a range of disciplines for just half the price of the Philosophical Review. The value of all this is chump change compared to the kind of savings that Bob has his sights on, I realize. But if we are comparing models of publications I think it is worth noting all the benefits and costs of each, especially those benefits that might be lost in moving from one model to the other.

"Even though we are one of the good guys and even though our way of doing things serves us and most of our stakeholders pretty well right now, there are reasons why moving to open-access online publishing is appealing to us from our perspective, all of them are pretty obvious. Publishing via the Internet is more economical than publishing via paper and snail mail. Research becomes public more quickly, although perhaps in Philosophy that is less essential than in the science, since we are still talking about work first published 2,000 years ago. Availability at the desktop is of course a convenience for readers. Philosophy is the sort of thing that people often like to read in their favorite comfortable armchair, but with personal printing of attractive quality that's preference can still be indulged. Being free of course would greatly enlarge our readership. Higher visibility for the journal means higher visibility for the Philosophy Department here and that is a good thing. Not much essential would be lost. We can still do our essential quality assurance rule. There is really not much reason to think that our reputation would suffer, and therefore our crucial role in tenure decisions and promotion decisions would be preserved. Cheap on-demand printing would take care of the needs of those who absolutely must have hard copy of the entire issue. And there is really not much reason to think there is anything about the philosophy culture that would prevent a move toward more online publishing.

"I think the most important reason though is that if we don't go to open-access online publishing others will. In fact, others already have. For two years, the University of Michigan Philosophy Department has been publishing Philosophers' Imprint, a free online-refereed journal (www.philosophersimprint.org). "The mission of the Imprint" --I am quoting from the website-- "is to promote a future in which funds currently spent on journal subscriptions are redirected to the dissemination of scholarship for free via the Internet." So, they are already doing pretty much exactly what Bob envisions. The cost of the publication is borne by the University of Michigan Library. The technical aspects are handled by the university's Scholarly Publishing Office. The editorial labor is essentially donated by the department and in particular by the two editors in chief, now Stephen Darwall and David Velleman, who as I understand it even do such lowly work as copy editing and formatting articles. Philosophers' Imprint is not a major competitor yet. It is not especially well known. It doesn't have the Philosophical Review's longstanding reputation. It publishes only a third the number of articles we publish and no book reviews, but its essential function is the same as ours. It is the product of a top-notch philosophy department publishing well-vetted high-quality research, and it's free. So, I think the threat to Philosophical Review is obvious -- if not by Philosophers' Imprint alone, by its technology, which could be adopted by any number of journals or philosophy departments, with the result that we and our quaint technology could be priced right out of the market. So moving to online open-access publishing not only looks like a potentially good thing for us, it looks like something we might be pushed to do.

"The big obstacle is funding. Even if Cornell completely pays for the actual publication and dissemination via Dspace or some other technology, as people have noted it takes money to run an editorial office, and where is that money going to come from if not from our subscriptions, which as I said are our only source of income? We might get some revenue from on-demand printing. We might consider moving to a model where contributors are asked to pay for some refereeing cost's but that would be a huge change in culture, in philosophy at least. If I heard him correctly, Bob said to me a couple of weeks ago that the University would just find the money. Whether that proves to be financially sustainable is really the big question. For us, if the economics worked out, moving to open-access

online publishing looks like a good step. But like I said, we are a simple case.”

Jeffrey Rusten, Professor, Classics:

“I want to react to what many have been saying about the advantages of digital publishing in saving money and the possibility of creating a peer review system for digital publications. Since I am in Classics, and following a speaker for a philosophical journal, I should start out with an important economic statement made by a Greek philosopher, Theophrastus, “the most costly expense is time.” That truth has a lot to do with the sort of simplistic and perhaps reactionary considerations I am going to raise at this point.

“I want at the outset to give you some idea of my perspective. One, I am from the humanities and we deal with a whole different set of issues than in the sciences. Immediacy, for example, is of much less importance to us than the time well spent on reading something of enduring value. There are already in existence far more articles in our discipline than we could ever read. We have to pick and choose and it could well be that something in 1875 is much more valuable than something in the latest publication.

“Second, I am more worried about monographs. It seems to me journals in the humanities are already moving toward the paradigm you all are talking about, or at least they can move toward that paradigm. Monographs on the other hand, and books in general are an essential part of scholarly production in the humanities. For better or worse, being able to put together a book is going to remain an indispensable claim to tenure or scholarly advancement of any sort in our discipline. There is a real crisis in monographs and in books for the humanities.

“I also want to distinguish between a personal commitment and an institutional commitment. I am myself am so interested in digital publications that most of my colleagues think I am a maniac. I own fewer books every week; I hope to own almost no books within ten years. I am scanning every thing I can, I try to rely on the library more and more; I always carry a scanner with me and sometimes have two in case one breaks. So, I myself am utterly committed to digitization of information; but part of my comments come out of the reaction of my colleagues and in professional associations and elsewhere to this attitude. They are not convinced, and I would like to tell you why. I am vice president for publication of our professional association for Greek and Latin. I am sure that I was chosen to bring them into the 21st century and yet I have vetoed every digital project that has come before us and I would like to tell you the reasons.

“First of all, when we talk about publishing from our point of view, it is just not print versus digital. There is a whole series of structures and institutions that exist already, that present formidable advantages to someone who wants to present a book to a conventional publisher. If you write a book and you get the Cornell University Press to accept it, that book will be advertised, that book will be reviewed and that book will be catalogued in the libraries. These things are an automatic part of the conventional publishing process. If you are publishing digitally, these things do not happen: you have to put together something very different to publicize your book and get it known in the humanities at least.

“On the other hand, quality control is also built-in with conventional publishers, because they must safeguard their continued existence as institutions. Conventional publishers today obviously started out as individuals with a mission and an idea and commitment, but the most successful of them turned into institutions that spread over generations--they could do this because at least they didn't lose money doing their work; and because they could convince the next generations to dedicate the time necessary, and this included making the tough decisions about what and what not to publish. Since conventional publishing must live with economic and space limitations, they can back up their quality control decisions with unanswerable arguments. When you are publishing books you simply can't publish everything that is given to you. You have the excuse that the space available to you in the book or the journal and the economics of your publication system don't allow you to take everything so you have to limit yourself. In support of these decisions, the peer-review systems that are in place, which have taken a long time to put together, are in fact going to remain more sophisticated than anything we can put together for digital publishing for some time to come, at least in my field.

“I want to give one example that is usually cited in our field to show how electronic publishing can work. It is called the Bryn Mawr Classical Review. It is an e-mail publication that comes to everybody that subscribes, hundreds if not

thousands of people all over the world. It reviews the latest books. You get two or three reviews every day. If the subject line doesn't interest you, you delete; otherwise you read it. You can print it out, if you want you can send it to someone else or you can archive it. It is very popular. Everyone writes for it now and it is one of the most read publications in our field. Yet the Bryn Mawr Classical Review only reviews publications in print--because that it is the standard. They tried to start the Bryn Mawr Review of Electronic Resources and it folded because nobody wanted to write reviews of electronic publications in our field and nobody wanted to read reviews of electronic publications in our field; they wanted to read reviews of books published conventionally.

“So, I think for the time-being the successes in electronic publishing are going to be niche successes, where you can find some interesting that does work given the limitations of the current model; or else they are going to have to be either geared toward print publications, in other words piggy-backed on traditional print publications; or else I am afraid digital publications are going to be second-class publications. That is what I have to confront as vice president of publications of our field, as discouraging as that might be.

Keith Dennis, Professor, Mathematics: “I am from the Mathematics Department, which I gathered from listening to my colleagues that mathematicians are a bit different from the scientists and the humanists. I suppose we somehow belong somewhere in between. Although I get the impression actually maybe we want everything. We want things immediately and we want all the old stuff too so that is sort of a problem. In fact, every time I have heard one of the speakers and I looked at what I wanted to say and I kept wanting to change it because the last speaker made some comment about having a scanner and getting rid of his books. Well I have scanner, but I get more books everyday. I also get more electronic things so there is no hope. Let me begin by saying something about why I am up here. I was executive editor of something called Mathematical Reviews which is an organization started in 1940. What does it do? Well it is not a journal in the sense that one would think of journals. There are no articles, no original articles published in it. It is basically just to tell you what everybody else has done, a long list of all the articles published in mathematics every year and some short description, maybe a paragraph, maybe five pages saying what the content is, what the value is and so on. That is what is supposed to be there. Sounds fairly simple. It is actually quite complicated. Let me give you some numbers. I am a mathematician. I have to give some numbers. So the organization started in 1940. The reason it started in 1940 has to do with history. The Germans had an organization like this that started in 1931 and sometimes during the 40s they decided it was not appropriate for Jews to review articles in their publication so first the editor moved out of Germany to Copenhagen and then he moved to the US and started the organization here. Let me say something about size – in 1940 there was something like 3200 articles that were published and reviewed in Math Reviews so a little bitty thing. In 2000 there was something like 70,000 articles which deserved some type of review in Math Reviews and that is actually somewhat misleading because in order to find those 70,000 articles – well in mathematics it is simply not true that everything about mathematics is in a journal called mathematics something or other. To find these articles you actually have to look at physics journals, chemistry journals, even in the humanities sometimes. Surprisingly enough there is something like 4,000 journals that one actually has to look at in order to find the mathematics articles.

“So you might think this is a rather odd thing but in fact this has been going on for a long time in mathematics. I am certain such things have gone on in other fields. I would like to say just a little bit about that. You know we always feel that everything is happening to us for the first time, nobody has ever had such a crisis. In fact, it was 1893 there was a big conference in Paris of mathematicians saying ‘what are we going to do with all this literature, we can't keep up, we need to make lists of it.’ And there was some French project that started out to make lists of mathematics articles and believe it or not they started with little packs of cards with your favorite subjects on each card and that went on until about 1960 when it died. A lot of other things died at the same time. These things happen and we think we are doing something new but various problems like this have happened before and in mathematics and in fact in the sciences there were all sorts of things going on in the late 1800s where people decided there was too much literature, ‘we can't keep track of it, we have to make lists.’ In mathematics the first thing happened in 1868, something called the *Jahrbuch über die Fortschritte der Mathematik*. Around the same time the Royal Society of London decided to do a listing of basically all the articles of all of the sciences which was really a major undertaking. These people were faced with some crisis about the explosion of publication. So they worked on that quite a bit. I didn't say something I intended to say a minute ago about how do you handle all this stuff in mathematics in modern day, how do you keep track of all these things? Is that a small job, a big job? Believe it or not, it takes about 75 full-time people working to create this thing called Mathematical Reviews, which is – although it is still published in paper it is hardly ever used in paper because it is all on-line and uses a database. So let me make a couple of

comments about the background here very quickly and then go on to two other comments relative to what we are doing.

“Electronics – all the stuff now is presented electronically and we all feel that its somehow that its safe. I would like to give you one example from mathematics. There was a guy named Hermann Valenteen who was involved in congress in 1893, in fact in started earlier making a list of all the publications in mathematics and every four or five years he would say he is still working on the project and I hope to be done sometime. He kept doing that until he died in 1946. He had listed something like 200,000 articles from the beginning of printing to when he died. He never got through. Not surprising. His colleagues discussed it for years about ‘well we really should publish this into a book,’ but it really was too big to handle at the time. There were meetings and meetings and nothing happened. It was stored in a library in Berlin. When I was in Mathematical Reviews we heard about this and decided this would be great if we could find that card catalog, we could have it keyboarded in. 200,000 is fairly small when the database at the time was 1 1/2 million or something so we could fill in all the way back. So I wrote to everybody I could in Germany, libraries and so on. Nobody knew what happened to it. Unfortunately I did find out a little later that in fact the card catalog he had created existed up until the month before I was born at which time a bomb fell on the library in Berlin and everything burned down.

“My first point is – when we put everything in electronic form we better be careful on archiving because these kinds of things do happen. History is full of them. I can give you lots more in mathematics and I am sure there are others in other fields. You have to keep track of these things. I actually had three things and now I have only one of them done it seems. So I will leave most of the rest of it as an exercise in mathematics. Lots of articles in the New York Times for example recently have said awful things are going to happen because if you multiply the rate of growth times something or other, either something is irrelevant or it gets to big and we can’t handle it anymore. There was an article last summer about why it didn’t make any difference whether you grabbed all the oil in Alaska because things grew so fast it wouldn’t make any difference. Another article I saw recently said, ‘well if the Sonny Bono copyright law and extensions are all approved then in a few years there won’t be anything left in the public domain. So of a growth rate, say doubling every ten years, you soon find out that even if every thing is in the public domain, ten years from now you would have half, twenty – quarter. Pretty soon things are irrelevant.

“These are using growth rates of something fairly small. On the other hand if you look at something like Elsevier’s rate of increase in costs you find 7.5 percent is that what they want to tie everybody into and you will find out that is almost exactly what you need in order to double prices in ten years. If I remember right the rate of increase in the Cornell Library budget is something like 4% and the exercise I leave for you is – compare those two numbers and see at what point the Cornell Library collection actually becomes insignificant compared to what has been published and it is surprisingly short. So that is a negative thing.

“Another negative thing I wanted to say is that I am really worried about the initiative that Bob Cooke has proposed because I am afraid it is going to be really hard to change the culture. That is really bad news. Let me turn some of the bad news into good news. The good news is that with the help of the publishers like Elsevier, this is going to happen very soon whether you want it to or not, because the old system is about to collapse.”

Joe Halpern, Professor, Computer Science: [See attached overheads.](#)

Karl Niklas, Professor, Plant Biology:

“As the last speaker, you might expect that I should come up with something different from what has been said previously. However, the sad truth is that everything I wanted to say has been said already, and better. What I can do is to take this opportunity and comment on some of the points made by the previous speakers, and to do so in my capacity as the current editor-in-chief of the American Journal of Botany. This peer-reviewed journal was founded in 1914 and is published by the Botanical Society of America. And our recent experience with going online may provide some useful insights into the challenges that face comparatively small non-profit scientific journals.

“By way of some background, let me say that the AJB is currently ranked among the top 10 plant science journals worldwide. I do not blush when I tell you that the journal is prestigious. And I am proud of the fact that it is a non-profit journal. Indeed, so much so that until just this year, the BSA actually lost money for every personal subscription. That might sound financially suicidal but the mission of the BSA and the AJB is to convey and

disseminate information pertaining to all aspects of basic plant research world-wide. The BSA takes this mission very seriously.

“In 1999, the AJB went online for the very first time. Anyone who wanted access to the journal could go online, read the journal’s content, and download its articles free of charge. This effort to disseminate botanical research was extremely successful. Based on the statistics available to the society, the journal was being accessed on a twenty-four hour basis and the number of hits was a flat-line with an average of 420 hits per hour. For a plant science journal, this demand is not bad. Also, at looking where the hits came from, it was immediately apparent that our clients were worldwide as the flat-line twenty-four hour period might indicate. In 2001, the society decided to charge for online access because it was becoming increasingly more difficult to financially support the project. The online subscription rate was and remains \$45. The effect of this change of policy was immediate and noticeable. Our number of hits per hour went from 420 to 90, and the 24-hour flat-line vanished to be replaced by a usage curve indicating that our principal users were from developed countries. Access by scholars and students in developing countries dropped significantly. An obvious lesson was learned the hard way. \$45 doesn’t mean much to many of us, but if you are in a developing country, as little as \$10 can be a high price to pay, even for a good journal. Nevertheless, the BSA had no choice in the matter. The society could not continue to dip into its endowment indefinitely. Naturally, the society remains sensitive to the needs of scholars in developing countries. We have special reduced subscription rates for these countries, and we permit one subscription to support a number of networked libraries in these countries. But the effects of charging our readership were immediate and negative. Many scholars can no longer read our journal.

“Let me turn to another, perhaps more important issue. Why do societies care about the paradigm shift mentioned by Bob Cooke in his introductory remarks? Scientific societies care because journals are their principal way of being visible worldwide. The AJB is published 12 times a year, and our membership ‘see’ the society 12 months every year. In this way, the society exerts a positive influence both for itself and for its science. Societies are also concerned about the quality of their science. That’s why they take the review process so seriously. In this regard, it is imperative that scientific articles are fastidiously reviewed, at least that is the opinion of the membership of the BSA. But the costs of producing a journal are not limited to the expense of seeking and dealing with reviewers. An additional and important cost is generated by copy-editing articles. Most scientific societies, at least those I deal with, take great pride in having a ‘clean copy’ journal, one that lacks typographical errors, maintains a high standard of grammar, and carefully maintains its formatting, such as reference protocols. Indeed, I take great pride in saying that the American Journal of Botany has a reputation for being one of the cleanest of the biological journals currently produced. But this costs money and it will continue to cost money even if a journal is exclusively electronically produced. Another reason why societies care about the paradigm shift from hard copy to online journal-format is that most societies are increasingly caught between a rock and a hard place, that is, between the high subscription costs for profit-making journals and the steady erosion of library budgets that is forcing many libraries to drop some of their journal subscriptions. In theory, and I must emphasize the word ‘theory’, going to online publication can save money. But the rock and a hard place has many curious side effects. For example, you would think that the American Journal of Botany, which has an institutional subscription rate of less than \$200 for both the hard and the electronic version, would not experience much of a squeeze in terms of institutional subscriptions. Yet, AJB subscriptions have steadily eroded over the past 8 years, despite the fact that the journal’s citation impact factor has increased over the same number of years. Curiously, the rate at which institutional subscriptions have declined is insensitive to subscription costs. Every time the journal’s subscription costs have increased, we have seen no fluctuation in the rate of decline. This phenomenon is interesting and somewhat disconcerting, because it means that declining subscription rates are the result of manifold factors, many of which are totally out of the control of non-profit societies. Journals simply don’t have control over their fate.

“Electronic publication provides a number of huge benefits to societies. In addition to increasing the visibility of a society, electronic journals are structurally supported by very powerful search engines, as you well know. A reader can go to an online journal and search for articles using key words or author names or critical references. These search engines also typically connect one journal to another. This provides a tremendous advantage to the networked journals as well as to authors because readers who would normally peruse the pages of some highly specialized journals are drawn into these journals. An additional advantage, is that journals and societies can archive information that would not normally be archived because of the costs of publishing these peripheral materials. Indeed, this is one of the selling points for the online version of the American Journal of Botany. We have links to what are called ‘supplemental materials,’ links that provide additional information to support the contents of papers such as basic

data matrices and even animated graphs and the like, items that could never be published in the traditional way.

“Nevertheless, the paradigm shift from paper to digital presents a tremendous challenges as well. For example, this shift is attended by a shift in the paradigm for financially supporting the production costs of journals that have been traditionally provided only as hardcopy. Right now, the production costs for producing the online version of the AJB are subsidized by the production costs for producing the paper version. Our electronic printer, HighWire Press, uses the typesetter’s computer disks produced by our hardcopy printer, Allen Press, to install the journal online. The costs of producing the journal would increase significantly under present circumstances if we side-stepped the hardcopy version and published online exclusively. And our income would probably decrease, because the subscription rate for our online journal version is lower than that for the hardcopy version. Another potential loss of income comes from reprints. In the past, authors have ordered and paid for paper versions of their articles. This has brought in some badly needed income. Currently, however, this income has dropped substantially simply because authors can download their articles as pdf files free of charge.

“One proposed solution to these problems is for journals such as the AJB enter into consortia such as BioOne, which offer libraries a journal-menu to cut costs. The problem with this approach is that the revenues brought in are unpredictable, since no society can anticipate a priori whether its journal will be selected widely and since the contractual agreement cannot be broken before the allotted time span. As a consequence, a society could go broke in a year or two, and so societies such as the BSA are unwilling to take the risk.

“In summary, societies and journals such as mine know that the future lies with electronic publication, but the future is financially uncertain and potentially lethal, especially for the smaller journals and societies that deal with highly specialized subject areas. My society is willing to provide its journal to readers ‘at cost’ but no society can provide a journal and continue to lose money. The larger and more expensive journals published for-profit are slowly and seemingly irrevocably driving non-profit journals off the shelves of libraries. The solution to this problem is purely a financial one. We must find some way to support the costs of producing peer-reviewed scientific journals for online dissemination and we must learn how to control the escalating costs of for-profit journals. As yet, we have not discovered how to do either of these things.”

Dean Cooke: “Thank you. I ask the panel members to come to the front of the room. I’ll put this up to remind you of their associations. While they are coming up if Ken King or Ross Atkinson has any questions or observations they care to make, I would propose that we take the final ten minutes of the period to allow the panel members to summarize their reflections.”

Kenneth King: “I just wanted to observe that if virtually all scientific journals have to publish electronically, and universities have to acquire a subscription to the electronic journal for all of their members, there will be very little incentive for faculty members to subscribe to journals, because they can get at them wherever they are through their computer through their institutional subscription, so the point of which is that the institution through its subscription will be paying for an increasing share of the total cost of getting that information. There ought to be some way in which those funds could flow to cover the cost of editing and copy preparation.”

Ross Atkinson: “I want to emphasize that while we are talking about an institutional effort here, all the leadership you are providing, this can only be done through a national or international effort. It is not something that one institution can do and make it work. It only works if everybody agrees that that has to be done and follows that convention.”

Dean Cooke: “OK. The time has come for you to either make an observation of your own or ask a question of the panel. Feel free to make it to a specific panel member or to generic.”

Professor Philip Protter, Operations Research and Industrial Engineering: “I’m an editor of the Elsevier Journal. I’m surprised that no one has even hinted at what seems to me to be an obvious solution if it could work, which is for the libraries in the United States to organize and present a united front against the publishers, because what is happening now is Elsevier has a monopolistic situation, or near monopolistic, and the libraries are fractured. Even the northeast library group couldn’t agree on a unified position. Elsevier is being vilified, partially correctly but maybe overdone a bit, because the libraries are failing in their responsibilities to organize in such a way to fight back. They are just

saying, 'There is this enemy. Woe is me. Let's do something else.' But they could resist and require the publishers to be reasonable."

Eberhard Bodenschatz: "I'm the chair of the Library Board and we have been discussing this at length. The first thing you have to realize is that the copyright statement at Elsevier that these libraries sign doesn't allow them to share the price. So the consortium can share the price inside, but if you go outside the consortium, the libraries are not allowed to discuss the price with a library in Germany or Canada or whatever. This is part of the statement that the library had to sign. There is not a published price, because everything gets negotiated. Elsevier actually as far as I understand it this is all negotiated in some sense or another. The other problem is that Elsevier is very good at marketing. I am an Elsevier editor, because I think the journal is very good. That's why I am doing it. I think I can work from the inside out and lead to some change, but it is very hard to argue with Microsoft."

Joseph Halpern: "I'm not a legal scholar by any stretch of the imagination, but I think if the libraries band together there may also be concerns about the legality of doing that, anti-competitive behavior."

Philip Protter: "The State of Ohio bargains as one unit."

Joseph Halpern: "Maybe the librarians can answer this a bit better, but I think there is one other issue. It is not clear to me that libraries are the right people to be talking. That is we are always asked what journals do we want; complain about journals if you don't like them. In the end we say these are important journals; let's keep them. There would be nothing to talk about if we all stopped doing what you and others of us are doing which is helping Elsevier. It is very hard for the libraries to negotiate from a position of weakness when there are in fact many good Elsevier journals. It's hard to not subscribe at all to Elsevier."

Karl Niklas: "There are a variety of pressures that are being exerted. Without mentioning names, there are two biological societies, very large ones that at their last annual respective meetings declared a boycott of a publisher. I won't mention the publisher; it is not Elsevier. Basically, as a member of those societies, you are more or less agreeing not to review for the journal and not to submit any work to the journal, and the society presidents sent letters to the editorial board explaining why they are doing this."

Ross Atkinson: "I think I just have to say something here. We have been advised by counsel, most institutions have, that banding together does have anti-trust dangers. It doesn't mean that you can't do it, but that's always been the information we had from legal authorities. The main thing is that we have people who say they can't do work without these journals, that they can't do their work. When that happens, when that's the clear message that the library gets, then those journals are indispensable and whoever owns them can charge pretty much what they want to. That's basically what is happening."

"I am Fernando Ponce, a graduate student in Plant Pathology. I come from an underdeveloped country, so for me it is very clear that the problems are much more acute than they are here. My question is what about publishing there? That would be a great way to reduce costs."

Karl Niklas: "If I understand the suggestion, the idea would be to move the production and publication machinery for journals to a developing country. In theory, that is perfectly reasonable. For example, there is no reason why the editor of a journal or the editorial board has to be in physical continuity with the actual, physical production. In point of fact, the American Journal of Botany doesn't do that. I suppose it's at least in the case of my journal that we are the American Journal of Botany and that all of the participants on the editorial board or that have served as editors are living in the United States."

James Gillett, Professor, Natural Resources: "There is a real issue here in the costing out of this eventually. Right now, the federal government is paying the majority of these costs. They are paying huge costs for their own publications and now we are paying out-sourcing fees to National Technology Information System and every other contractor down the line to retrieve the stuff that we did that went into EPA or somebody put into an EPA paper. It's absolutely ridiculous that the federal government is the basic money pump for this. We have to find some way to really divest that, because we can't keep that going."

Kevin Dezfulian, Grad Student, Applied Physics: "It seems to me from speakers that there are two separate problems here that we are trying to solve. One is the stop paying \$30,000 to \$40,000 an article. Are we still going to have to pay \$100,000 for the peer review process and then the attempt to shift to online publishing where we can get things for free? It seems to me in solving the first problem something societies or various interests groups are more able to do by having boycotts and things like that but it is such a change in our behavior. Maybe that couples with groups of universities providing an infrastructure to have a new physical repository for online publications. It seems to like there are two separate problems."

Paul Ginsparg: "It is a point I forgot to make but is absolutely essential. You can look at the distributions of costs in aggregate, for continuing the current publication system, and take into account that in a number of fields it'll be continued more or less as currently, and then ask from where can savings come. Assuming that the non-profits are being honest and their revenues reflect their costs for legitimate editorial services, then the costs can't be reduced below that level. Some costs in a new system are going to be shifted around, for example shifted from the publisher to the people that are buying the laser printers, but overall the costs in the system are going to be the same unless some of the profit currently accrued by the commercial publishers, the ones driving up the average revenue per article, can be recouped. There may be a few other ways of reducing costs within the current system, one by coincidence I did mention to the American Physical Society, not in complete seriousness, but the reason the costs to the American Physical Society publications are not going down is because they are a labor intensive operation. We all know that anything that is labor intensive increases faster than inflation because inflation is an average rate that averages in for example the lower costs of those types of labor that could be moved abroad and other less labor-intensive forms of productivity. So one way you can increase less quickly is to move your operations to the developing countries, but for some reason the American Physical Society didn't instantly jump at the opportunity to move its editorial operations to Ecuador."

Fernando Ponce: "Actually maybe there are people who will be eager to help."

Paul Ginsparg: "In the long run, I agree one will have to take ..."

Fernando Ponce: "I think we need to put more interest in this because like Karl said there were 400 hits per hour before they started charging \$42 and then there were 99, so that it is huge amount."

Paul Ginsparg: "Just to complete the response to the other question - the other aspect of this moment in history involves the large-scale entry of the commercial publishers. They may seem as though they've always been around in scholarly publishing, but it is a relatively short-term phenomenon, largely a post World War II effect due to the large horizontal expansion of the research effort in this country (in part due to federal funding in the aftermath of Sputnik). One of the hopes, and this is in the positive sense of the institutional repository ideas and an increased role for professional societies, is to move the scholarly publication back to what it was a century ago when it was dominated by those institutions. The second element of hope is that if you look over long periods of time, and ask which are the publishing entities that survive, you find that virtually none of the commercial publishers are in it for the long term. As Keith discussed, the current policies involving price increases that outscale inflation, appear unsustainable in the present fiscal climate. Perhaps they are trying to get as much as they possibly can from the market on some ten-year timescale and then move to something else to satisfy their shareholders. They're businesses, and that's what they should be doing. The only ones that remain it for the long term are the professional societies because they are the ones whose services to their members take precedence over commercial obligations, so they're forced to find a way to remain viable. So there is reason to hope that one could catalyze a transformation of scholarly communications infrastructure with institutional repositories. You have to start somewhere. The comment was also made, and was implicit in my earlier remarks, that at least in the physical sciences, we're seeing more than 70% of the material coming from abroad. So even in the extraordinarily unlikely, fantastical circumstance that every institution in this country were to put up 100% of its output and participate in some aggregated system, that would still constitute only 30% of the world's output, and some significant percent of the remainder is coming from the third-world as well. The problems are extraordinarily difficult but again, you have to start somewhere."

Eberhard Bodenschatz: "You also have the paradigm shift, As far as I understood the new Journal of Physics, for someone able to negotiate with China they actually pay these refereeing costs for every article that gets accepted

from China in that journal. China will actually pay the refereeing costs which I find amazing because they value it higher to have it free for all. For them, it is a great investment, right, because they get this store of riches for free by financing a few papers from China which have to get referred to come into the system. For me viewing this paradigm shift it is really great and I mentioned that to the main person in my Elsevier office and she actually listened. She said this is actually something we should talk about. So they are actually willing to talk about these things but in the end what matters is how much money does the shareholder get and if there is something where they can make enough money out of it they might actually go that way to.”

Karl Niklas: “At least for the biological sciences, my sense over the last eight or so years, having served as the editor-in-chief and talking to other editors, is that the not-for profits society journals are gradually going extinct. The shift is definitely in favor of the large commercial publications rather than the smaller society journals and the reason probably is purely psychological. I have talked to some of the better scientists in my discipline, the really good work they want to see appear in Science or Nature. Why, because they are worldwide and heavily subscribed to and because they are a glitzy kind of dazzling journal, three color, all sorts of add-ons, all sorts of attraction so of course if you produce something, quote of Science or Nature caliber you are going to submit to Science or Nature, you are not going to submit to some smaller journal that doesn’t have the star quality that some of these larger commercial journals have. Of course, these commercial journals make lots of money by selling advertising space. And in point of fact, for the not-for profit journals it is actually illegal to make money. We could bring in revenues for advertising, but you realize that the revenues that you bring in from advertisers is commensurate with your disability as a journal. There is kind of a negative spiral affect in a sense that they glitzy journals are spiraling upwards and the not so glitzy journals are spiraling downward and I don’t see that trend breaking.”

Lenore Coral, Music Librarian: “I am on the board of the American Musicological Society and I am also the Music Librarian here at Cornell. The Journal of the AMS which is the most distinguished music journal published in the US and maybe in the world is published by the University of Chicago Press. They have just raised by a very high percent the amount they are going to charge the society for publishing it and also a very high fee for making it an electronic journal which has here to for been only a paper journal. So we are in the process of exploring other avenues for publishing this journal because we don’t want the price of its publication to go up. It is giving to the members for free and institutions subscribe to it. There are plenty of things going on in the humanities, nothing like what goes on in the scientific publishing world but we in the humanities are fighting to keep the costs down in these ways and even when we are working with university presses.”

David Shmoys, Professor, Operations Research and Industrial Engineering: “I guess there was one issue that none of the panelists addressed that I would be curious to have some reaction to and that is the digitization of the archive. There are some fields which only the last five years matters and there are some fields for every other fixed threshold. For any field which doesn’t it exist simply in the very immediate past there is the issue of and this is a capital expense and the question is where is this capital expense going to come from.”

Karl Niklas: “Actually Jstore has actually scanned and digitized all of the issues of the American Journal of Botany up to ...”

David Shmoys: “But Jstore is a limited pool of journals.”

Karl Niklas: “I agree but what I am saying is that you can actually foresee there is going to be archiving.”

Eberhard Bodenschatz: “As far as I understand Elsevier has a big program working on archiving way back to the first article that was every published. It is happening.”

Dean Cooke: “Let me respond for the project. We have money in the grant to world-class economist to look at the economics of the national system. Now a 111 research universities struggle to buy a copy of everything. If in fact you didn’t have to buy and you didn’t have to pay for the building space to store it that would free up some money. The question is how do you get the money from the capital budget into the operating budget and our hope is that we can present a compelling case that in fact it is sustainable that we can get the national leadership to make that transition occur.”

Keith Dennis: "In regard to digitization, at least in mathematics – in mathematics the older literature is essentially all of it is still valuable. There is now a proposal to digitize everything. In fact at Cornell, Jean (?) in the library and I have a grant with NSF to try to organize an international cooperative effort to digitize all the past mathematical literature for which we can get permission. Some publishers, at this moment namely university publishers and one commercial publisher are interested in cooperating. There are many initiatives around the world that are starting. In Canada there are probably will be one next year. The European community is starting one now and so on. So at least in mathematics this process has actually started."

Dean Cooke: "My own political observation is that we have to change the focus. I think the only way to do it is to get it before it gets on the shelves so you don't have to fight with the faculty about taking it off the shelf."

Eberhard Bodenschatz: "One of the editorial boards I am on, Mathematical Programming, the journal used to be an Elsevier journal, it was moved to Springer because of the skyrocketing prices and Elsevier took off of their website access to anything was already digitized. All these project individually among the commercial publishers I still worry about whether the long term future is that way because they don't have the financial incentive of linking it back to the past.... The electronic version of those issues which Elsevier had already make electronically available was rescinded."

Dean Cooke: "Ross remind us – one publisher gets 25% of your serials' budget?"

Ross Atkinson: "Yes."

Dean Cooke: "One publisher gets 25% of the University Libraries subscription budget."

Kenneth King: "What percentage of the journals you get from them, for the 25%?"

Ross Atkinson: "A little over one percent."

Krys Cail, Graduate Student, City and Regional Planning: "I just wondered, you know every time people talked in terms of having things available on the Internet digitally it was in terms of freer access around the world. Does anyone foresee the kind of situation where supposed misuse of information saying nuclear kinds of things by North Korea? And are there certain areas of the world that are considered non-cooperative, just being an information black out?"

Paul Ginsparg: "The first comment is that you probably wouldn't be able to suppress information flow even if you wanted to. There are countries like China which have tried to prevent their citizens from having access e.g. to google searches, but there are anonymizing proxies and many other methods to get around restrictions. The question is very relevant right now, and I've been asked this question a few times recently, `suppose - the one at the fore right now is bioterrorism (there's a meeting in Washington next month of the editors of major journals on this very issue), a journal receives something that could be sensitive for homeland security, will they publish it anyway? It becomes an extremely difficult question for an institutional repository. Suppose some biology researcher at Cornell decides to post on Cornell's institutional repository something that was excluded from a journal because it shows how to genetically engineer some organism that could then pollute water supplies. What do you do with that kind of thing? That is why my reaction was no, I don't want to take that question."

Rebecca Schneider, Natural Resources: "I am curious about the transition from one medium to another. All this has happened in such a short time. Technology is changing so rapidly. I expect it will change again in the next ten years, so in the interim you do these scanning or however all these journal articles go into technology then you have this big body in one computer format and then down the road it needs to be converted into another format. So as you do the economic analysis have you taken into account the fact over this time frame you are going keep having to update everything to a whole new format? "

Dean Cooke: "You know that it is going continue to evolve as we get new kinds of data structures. My simple answer is everything that can have meaning in paper ought to be printed and stored somewhere, at a few sites, not at

every university. So you could always go back and recover. But we already, in the movie industry and a lot of multi-media materials that still is a serious problem. What the library is in the process of committing itself to is that we will give you back exactly what you gave us. They are not promising that it will be transformed over, over and over.”

Eberhard Bodenschatz: “One thing, at least to me, the only way to keep this data alive is to really keep it alive. That is to make sure it is always available. Never put it away and say come back five years later. What I see when talking to many people is we just don’t know what it will cost”

Keith Dennis: “One of the things that seems clear is that it is much cheaper to develop new software to render the old data in current formats than it is to convert all the data. It seems to me that it is the only thing. You will have to transfer from old storage systems to new storages but you don’t necessarily have to change the format of the data. Much cheaper to change the way you get access.”

Joseph Halpern: “ I think in this world, bigger is better. In the sense, if you have something published in a format where there is only 100,000 other things in that format probably it will die. If you have something published in a format where there is 10 million things in that format, in the next format, there is going a lot of effort to make it backwards compatible. I think that is our hope, basically. I feel the same way, by the way, about where you store your stuff. Having a lot of small repositories is a mistake. Having fewer bigger ones is smarter because all these costs tend to be amortized over size. My guess is that if you put your stuff in a smaller repository at the next little paradigm shift it will die because they won’t have the funds to change them. If you put your stuff somewhere big like Paul’s archive, well there will be a lot of pressure for the Physics community to make sure that is always available. I don’t know how much it will cost, I don’t know what it will take but I am willing to bet money that it will be there.”

Karl Niklas: “Just two, I hope, relevant observations. One is that the biggest expense for my journal is paper. That is the biggest chunk out of our production budget so if you can bypass the paper you are saving a lot of money that you can reinvest or reallocate. In terms of this business about changing technologies, the analogy I think of – probably nobody here is maybe that old but 78s, 45s, 33 1/3s, now CDs. Now we are going to all other formats. I can still listen to Jussi Bjoerling singing and Enrico Caruso and they were recorded on cylinders. If it is a quality product it will be re-recorded and reissued in a different, more recent technological format and I think quality journals will survive. I am not concerned about erosion. There will always be paper archive of the material somewhere.”

Phil Davis, Mann Library: “One of you mentioned that it takes a lot of momentum to move from one Nash equilibrium to another. Librarians have been complaining about spiraling journal prices since the 1980s. Are we going to hit this momentum? Or do we have to suffer for a few more years. Do you think the turning point is happening now or do you think we are going to have to suffer for a few more bad budget years and then maybe we will have enough momentum to jump?”

Joseph Halpern: “You are not the ones that need the momentum. I think you would have moved along time ago. I don’t think we are feeling the momentum because it is not our budgets that are in trouble. For better or worse, the wrong people have the incentives right now. Speaking as an economist, librarians have lots of incentive to change the system. They are feeling the pain in their budgets. I am not feeling any pain in my budget. I actually try hard to do something about it but the truth is, the system is ok for me. It is not broken from my point of view. I don’t hear the pain of the libraries with all due respect.”

Dean Cooke: “I can respond from the project standpoint. We understand that the university presidents are the ones who are going to have to make the decisions to change money from one kind of budget to another and this is going to have to be a national effort. That is the point that Ross has made, eloquently. So we have invited Jim Duderstadt who is the former president of the University of Michigan and is one of the foremost leaders in information technology as a university president to head our advisory board. We are going to commission a study and Duderstadt’s committee’s job will then be to convince the rest of the rest of the presidents of other universities that now the time has come so our purpose in the project is to try to get to a tipping point and create conditions such that change will happen on its own. Now whether we do that or not remains to be seen but that is our intent.”

Marty Schlabach, Library: “ I think this has been mentioned facetiously before but I would like to put it out anyhow.

If it is indeed the commercial publishers pricing behavior that we want to change and if indeed they are publicly traded companies in the interest of doing the best for their shareholders and if indeed universities have enormous endowments that they invest, why not put the universities' investments into the major commercial publishers and get controlling interest?"

Keith Dennis: "That seems backward to me. If we have money in there, we want to take it out. We want to have a reason to bring them down. We don't want them to have an incentive to have their profits go up."

Marty Schlabach: "If you have control why couldn't you affect their pricing to be more reasonable?"

Keith Dennis: "Why would you if it hurts your own income? I think it would be much better if someone, and I am on the library board by the way, I think someone and I hope it would be Cornell and others will simply take a stand and say No to Elsevier. I know it will hurt, but we really should do that. It is the only way to stop it. We are watching basically a robbery in progress and we are not doing anything about it."

Dean Cooke: "I am hoping that we will offer competition and if you offer it free without a royalty charge that that ought to be pretty good competition."

Paul Ginsparg: "Conceptually, I am very much in favor of the notion of institutional archives because from the scholarly academic point of view, I think it makes eminent sense for the university to be taking control of its intellectual output. We don't know exactly how that will be realized, and what influence it will have. My own experience is that when the research material is out there, and freely available, things happen that you couldn't anticipate. That is part of what Bob was intimating with mention of "the tipping point." If all institutions took that kind of control, then we would have the rudimentary structure for various forms of reform of the current system. I think there are a number of possibilities for making it more efficient, for making it more effective for researchers, for taking advantage of the new communications technology that really haven't been probed yet. I think it is going to be very, very difficult enterprise to get a substantial part of the university signed on to this, but if we could get even 20% of the Cornell's content up in this form on a five-year timescale, it would be a fantastic success. If things are really catalyzed, and if on some ten-year timescale we could get everybody in the university to participate actively, it would be a wonderful accomplishment."

Eberhard Bodenschatz: "I thank you very much. I very much liked the publishing pay first type of free thing because it is wonderful for everybody in the world and they can read it. Someone on the moon could read it. The other thing I want to say is that whole instability might just go poof because if I was Elsevier or someone else, no matter what I would consider finance 0% financing. I would suddenly say oh, if you want I give you 3%, I give you 2%. You can do that for a while and slowly work your way up again. If you see the market doesn't give what you want you should reduce it. As soon as we come down to 2% increases, the library doesn't suffer, the library gets a 4% increase and everything is nice and smooth and we don't have to change anything. This is my warning - next year might be very, very different because instability might not happen because publishers react."

Jeff Rusten: "Even though this is all about science. First of all it becomes clear to me that I shouldn't have been invited to this because I used to think that the high costs of particular journals in the sciences were a function of the whole qualitative difference in expenses for scientific research. Now I realize that it is not the case and now I am really a radical about the costs of scientific journals. I am much more hostile to Elsevier than any of you scientists because they are stealing that money from the rest of the university. I applaud those people that say we should take some radical action and I think they would find very appreciative support from faculty members in other disciplines. The second thing is that - these are two criticisms - where is the University Press? What is the story? Cornell is a publisher, every major university is a publisher right now. Either the University Press isn't working with the university or the university isn't working with the University Press or they are both working on something and it is so top secret that they don't want to talk about it, or else the whole thing is just going down the tubes."

Dean Cooke: "Let me end by asking you to sign the guest list so if you want to be kept informed of other things and especially if you are an editor or a member of an editorial board you might form a brain trust for us."

"Thank you for this very useful conversation."