International Transfer of Information in the Physical Sciences

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Outline:
How should we proceed in this period of adaptation?

- What to we do & how do we share information now?
- What is the larger context in which we do all this?
- How are these modes of communication changing?
- What challenges and problems must we address?
- Is there a possible direction we haven't yet explored?

How do we communicate now?

- Publishing journal articles, reviewed
- Circulating data--individual items or databases
- Conferences, with or without proceedings
- Electronic archives--several kinds
- Internet exchanges, especially international

An observation re databases

- Some scientific databases are simple repositories for data of almost any quality
- Others contain critically evaluated data, accumulated previously but then scrutinized and evaluated by experts; c.f. the *Journal of Physical and Chemical Reference Data*
- The latter are eligible for copyright; the former probably merit no protection whatsoever.

What about refereeing?

- A low threshold
- Not effective for subtle errors, but that's ok
- Not meant or effective for outright fraud
- Anonymous; why?
- Said to protect lay readers, especially re biomedical publications

What about conferences?

- Large meetings of professional societies
- Somewhat smaller, specialized meetings, often with published proceedings
- Still smaller meetings, e.g. Gordon Conferences, with *no* publication allowed
- Workshops intended to further discussion and research in specific areas

And our e-mail on the internet?

- Probably the biggest impact from electronic communication
- Greatest impact on international communication; national boundaries disappear
- Equally easy to work with someone in Moscow or someone in Madison
- Everything from notes & proposals to book mss.
- Greatest impact may be in developing countries

The larger context of publicly funded research

- Governments and foundations fund research to generate *public goods*
- Public goods are those that do not diminish in value with use
- Scientific public goods generally *increase* in value with use
- Dissemination is *necessary* for scientific research to produce its public goods

A mandatory responsibility of the funder

- Because dissemination is necessary for products of research to become public goods, the funder can only achieve its goal by assuring that the results are disseminated.
- If means of dissemination are available that don’t need support of the funder of research, then those can surely be used. Example: traditional journals before e-communication

How did things evolve?

- Number of journals increased exponentially until late 1990's
- Costs to subscribers, especially libraries, did the same
- Then came electronic means! First, electronically-maintained databases

Evolution in the electronic age

- Electronic composition of journals
- E-mail
- Electronic access modes via keywords
- Posting of abstracts, then full texts
- Posting of full texts in searchable form
- Posting of supplementary material
- Posting of full archives of back issues and forthcoming articles

How much access? What should "open access" be?

- Whatever anyone chooses to post, e.g. arXiv?
- Open access after a delay for subscribers only?
- Publication after open posting? Or the other extreme, disqualification of anything presented prior to submission?
- Open access in developing countries, not elsewhere?

The importance of a permissive environment in a time of exploration

- To find suitable ways, we must try many
- This can only be done in a permissive situation, particularly regarding laws & regulations
- Restrictive conditions are *counterproductive* in our current situation; they inhibit the free competition of alternatives and are simply bad economics

Two unavoidable issues

- Reviewing and refereeing: what procedures will assure the scientific integrity of what we communicate?
- Financial stability of the modes of communication: how can we pay for sharing information?

Ginsparg's solution to reviewing

- Initially, Publish (Blume: "publish") without prior review
- Select the articles that may be important
- Review those
- Publish them or discussions of them in a review-like format

Problems of paying for it

- Will open access destroy the financial bases of journals?
- Will open access destroy sources of funds for professional societies?
- Will open access do irreparable harm to commercial publishers?

How should we do our experiments?

- Let different modes compete, especially within each scientific field
- Look not only at the revenue of each journal; look also at the choices of journals authors make, and at the evolution of impact factors of competing journals
- Examine these country by country

How to pay: a modest proposal

- Wherever the traditional subscription-based, user-based mode works, no need to change
- An alternative, a form of author-based payment--but different from the ineffective optional page charge mode

The method

- Premise: the funder is strongly motivated to have the results of the funding disseminated
- Premise: the author won't allocate discretionary funds for publication if at all possible to avoid it
- The cost of publication is a tiny fraction of the cost of the research
- So...

Publisher bills the funder directly!

- Publisher fees must be based on real costs of publication (and presumably whatever the subscriptions have been supporting for professional societies)
- An agreed-upon upper limit of fees chargeable to the funder can be set
- If the publisher's charge exceeds that, the author must use his or her discretionary funds

Advantages

- Journals would be supported, however extensive their open access is made
- Open access would become free of taint or questionability
- Funder would be assured of reaching goals
- Author would be relieved of ambivalence between supporting publication or research
- Not everybody has to play

Conclusions

- Open access must be put in an environment in which it can compete on an even basis with alternatives--and see how each works!
- Permissive, rather than restrictive, regulation and legislation is necessary to achieve this
- Pathways must be found to remove barriers to open access and maintain stability of our systems of scientific communication