

STANFORD UNIVERSITY
STANFORD, CALIFORNIA

DEPARTMENT OF GENETICS
School of Medicine

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Mr. Eugene Garfield
1122 Spring Garden Street
Philadelphia 33, Pa.

Dear Mr. Garfield:

I've just returned from a trip abroad to find your delightful letter of the 21st.

Yes, I've known Gordon Allen for a long time, but we never discussed your scheme. It simply made a strong impact when I first read it, and I hunted back through Science to find it again when for some reason I was reminded of it.

I think I have to agree with you that some advance work should be done to find the bugs in a working system, and I certainly feel this should have public support. In fact, I think it would if you were to resubmit now. I imagine your tactical error was in approaching the NSF at a time when, to put it bluntly, it was too broke to do more than a fraction of what it should. It is still not so well financed, and I think you might have better luck with another agency. In fact, the way to push it is to submit the same proposal, with due notice, to all the agencies who could be interested. These would include NSF, NIH, AEC, ONR, AFRDC.... The scheme has, I should think, better prospects of adoption in biology and medicine than in chemistry: partly because chemistry probably lends itself better to interpretive subject classification, so that ~~XXXXXXXXXX~~ Chemical Abstracts already does a fairly good job, and then in turn you have somewhat less inertia to fight. Perhaps it should be stressed that citation-indexes are no substitute at all for abstracts, and they would overlap to some extent the use of subject-indexes. But for the sort of costs you quote, why not anyhow? Some points you may already have stressed, but can be reiterated are that the job would need mainly money and machines, not professional manpower (which is already an unbeatable limitation to any really comprehensive enlargement of conventional abstracting work). Also it can be conveniently decentralized-- even, in some places to the point of publication. One way to illustrate its mechanical advantages is to point out that a staff could even index papers in foreign languages ~~xxxx~~ without understanding the text, just provided they can read the reference lists onto the citation cards. In any case, for a world-wide scheme, a lot of the work could be done abroad especially, but not necessarily exclusively for publications in languages other than English. (From what I learned of the relative costs of a punch card operator in Italy vs. California, you might well want to farm out a fair part of the work!)

I would be very happy to read your papers and proposals on the subject.

I was absolutely astonished that citation indexes are not long since a standard feature at the Patent Office. Do you mean they are not even available for references from one patent to another? Perhaps the PO felt that a CI search would be too readily accepted as a basis of claims for novelty and they should be more cautious. Certainly a CI should turn up a lot of invalid claims that are incorporated in issued patents, which someone might have cause to fear!

I haven't given adequate thought to a reasonable experiment, but have some suggestions nevertheless. I would start with some review journal, the papers in which are most likely to define relevant connections in later work, and to be cited in them.

Suppose, for example, you scanned all the journals you now cover for Current Contents for citations to Physiological Reviews either for a specific year (say 1952 -- since I have a paper of my own there whose ramifications would be personally consequential) or for a definite period, say 1950 and later.

You could now make a critical comparison. Take a few dozen titles from Physiological Reviews and ask a jury to suggest the range of subject-headings they would expect to define the connections of each review. Then compare what you have retrieved by CI with the subject indexes from, say, Biological Abstracts or the Current Lists. You will of course disregard items from journals outside the common domains. The same jury could evaluate the relevance of the CI vs. the other retrievals, and the extent to which the irrelevant items in the CI compensate for its doubtless greater efficiency (i.e., errors of class 1 vs class 2). Probably the CI from one review journal won't quite match Bio Abstracts, but at that it might come close-- and the datum itself is worth having. In some ways this is not a fair test, since this is not the best use of CI but it should carry some conviction.

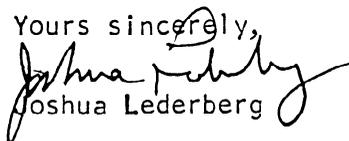
Have you any idea what an enterprise like this would cost?

An institutional affiliation is probably a less important issue in getting support now than it was a few years ago -- partly because the NIH etc. have had to be more liberal about this, partly as you're becoming somewhat of an institution yourself. But it might be worth talking, say, to Dr. Hilary Koprowski who is a keenly intelligent scientist, a good friend of mine, and the director of the Wistar Institute and pertinently of its Wistar Press, in Phila. I don't think he has any connection with Bio Abstr.

The NIH would be an excellent target for you to go at for several reasons-- among them they have almost enough money to be imaginative, health sciences would make a more manageable area for initial coverage than all of science, and there is a ~~XXXXXX~~ tremendous communication problem in rapidly moving fields like cancer. Also the NIH is anxious to evaluate its 'impact' on scientific progress, and how better do this than through your scheme -- viz. if a reference to NIH support is treated as a primary citation in a special study. Dr. D. R. Lindsay, Division of Research Grants, NIH, Bethesda Md., would be the party to talk to about this possibility.

One more point-- I am told locally that the Lockheed Aircraft Corpn., Research Division, Palo Alto, Calif. has a quite large program on 'systems approaches' to scientific information retrieval, and particularly would have some of the best computing machinery anywhere to ~~handle~~ handle a job like CI (though I would suppose punch cards would do well enough for primary indexing.) A Dr. Jean Duncan is in charge. If I make some suggestions that may seem inane or obvious, it is partly in a state of shock at some of ~~the~~ implications of your letter.

With best wishes,

Yours sincerely,

Joshua Lederberg