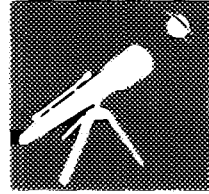


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TOWARDS THE WORLD BRAIN

In 1938 H.G. Wells described his conception of the future information center. He called it the *World Brain* (1). The book bearing this title is really a collection of Wellsian essays, some of which have little or nothing to do with information retrieval. In a recent article published in *Science* (2), I used the idea of the World Brain as a literary device



to place the *Science Citation Index* in proper historical perspective. Subsequently, in what started out to be a review of the 1961 *Science Citation Index*, Steinbach (3) questioned the value of a World Brain because it ostensibly plants the seeds of authoritarianism. These arguments sound very much like those one hears about the potential but not always realized dangers of science. In short, knowledge, like power, can be dangerous. It is the unique role of man to make the proper choices in the use of power and knowledge for good or evil.

World information centers are badly needed. No university could operate effectively without library facilities, and world-wide multidisciplinary research cannot be conducted efficiently without convenient access to broad-based information sources. The idea of a World Brain is a general concept towards which we seem to be moving. As things stand at present, the situation in scientific information is quite chaotic. To dramatize this point, there follows below a passage from my testimony before a Congressional committee which has been investigating the need for an American-based World Brain. This testimony may provide a little more insight into the rationale of the *Science Citation Index* and how it will be a giant step in the direction of the World Brain which, I believe, far from being authoritarian, is a step in the direction of freedom because of the improved communication and access to world knowledge.

PREPARED STATEMENT BY DR. EUGENE GARFIELD (4)

We all take the telephone for granted. When we have to wait more than a few seconds for a dial tone, we grow impatient and frustrated. When we call information—seconds seem like hours. We also take for granted the telephone directory—that innocuous book which methodically lists names and numbers in alphabetic order. Imagine the chaos in the telephone company information centers if one day every other page in everyone's phone books were missing. Imagine your frustration if most telephone numbers were "unlisted"—if a special, prolonged, and elaborate effort was necessary each time you made a call.

Contemplate the chaos in your city if there were hundreds of different phone books—some arranged by people's national origins, others by occupations, by district or by name—yet none of them complete. Each time you needed a phone number you would have to know whether your friend was Irish, or a janitor, or whether he lived in the north side of town. Suppose that in each city the system was different—each used a different terminology or system of spelling—a janitor might be a superintendent or a maintenance engineer.

Suppose each of these phone books, large and small, is only half complete and at least a year old when it arrives. Suppose that phone books were not free but cost so much that only libraries could purchase them. Imagine your frustration if you had to go to the library each time you wanted to make a phone call.

Now what has all this to do with the so-called information crisis? The situation I have just hypothesized is a fairly accurate description of scientific communication today. There are some obvious exaggerations. On the other hand, there are even more chaotic aspects difficult to convey by simply analogy. We all use the yellow pages, the classified directory, and frequently find it difficult to locate a number because of peculiarities in our language. Gas stations are listed under service stations and sell gasoline; gas companies may be listed under power companies and sell gas. In science, terminology is constantly changing—faster than the lexicographers or dictionary publishers can cope with. Every scientific dictionary is obsolete long before it is published.

In science communication we not only call local numbers—we are constantly trying to place long-distance transoceanic calls because science is international. Our telephone operators, the information scientists and librarians, must be able to handle dozens of languages including Japanese, Russian, and other exotic tongues.

However, this is only the beginning of the difficulties. After painfully identifying the telephone number of the scientific document he needs, the scientist can't simply dial the number. He must first identify the telephone exchange that handles this number. He may be lucky and find that it is a local exchange. Quite frequently he will find that he must call a Washington exchange or some other remote city. But scientists are stubbornly persevering, and having learned the proper exchange, put through the call only to find that the line is busy. In fact, the average waiting time is a few weeks—and by then—if that hasn't discouraged him—he may find that he called the wrong exchange, the number is out of order, or disconnected, temporarily or permanently. It is not surprising that by the time his call does get through he has sometimes forgotten why he called in the first place.

The working scientist places hundreds and thousands of such calls each year. He would call more often if he did not anticipate, consciously or intuitively, delay and frustration. The net result is that he gives up and only makes a call when he is absolutely desperate. If he can afford the luxury he will turn the job over to someone else—an assistant or a librarian.

Today's system of scientific communication is absolutely chaotic. That we are able to operate with it at all is a tribute to human perseverance. Science communication is still in the pony express era.

- (1) H.G. Wells, *WORLD BRAIN* (Doubleday, Doran, Garden City, N.Y., 1938).
- (2) E. Garfield, "SCIENCE CITATION INDEX -- A New Dimension In Indexing", *Science* 144(3619), 649-654 (1964).
- (3) H.B. Steinbach, "The Quest for Certainty: SCIENCE CITATION INDEX," *Science* 145(3628), 142-143 (1964).
- (4) E. Garfield, Testimony before the Ad Hoc Subcommittee on a National Research Data Processing and Information Center of the Committee on Education and Labor, House of Representatives, 88th Congress, 1st Session on H.R. 1946. Volume 1, Parts 1, 2, and 3, pages 227-251.