

Current Comments[®]

EUGENE GARFIELD

INSTITUTE FOR SCIENTIFIC INFORMATION[®]
3501 MARKET ST. PHILADELPHIA, PA 19104

**Expanding the Searching Power of CD-ROM:
ISI's New *Social Sciences Citation Index Compact
Disc Edition* Is Compatible with the *Science
Citation Index* on Compact Disc; New Software
Streamlines Searching**

Number 37

September 11, 1989

ISI[®] has enhanced the software for the *Science Citation Index[®] (SCI[®]) Compact Disc Edition*. Concurrently, ISI is releasing the new *Social Sciences Citation Index[®] Compact Disc Edition*, which is totally compatible with the *SCI* version. Major improvements in software include faster searching, single-disc storage, and more options for displaying and saving data.

I've often referred to H.G. Wells's idea of the "World Brain," as well as to Vannevar Bush's concept of the desktop "Memex" workstation.^{1,2} Today we are even closer to realizing the dream of instantaneous access to the literature. Almost any researcher today and certainly any research library can afford a personal computer (PC) and compact disc (CD) player. For those who already own a PC, the added cost of the CD-ROM player is trivial in relation to the potential savings of labor and online search time. And I say this with the Third World especially in mind.

The development of the *Science Citation Index[®] (SCI[®])* on CD-ROM, which I reported on last year,³ has enormous significance for research scientists and librarians everywhere. Not only can your library utilize this technology to provide unprecedented access to the literature, but you yourself can now literally have the World Brain at your fingertips.

In the past few years, we've learned a lot at ISI[®] about this new technology. We already have four consecutive years of *SCI* data on CD-ROM, and now we've added similar coverage for the *Social Sciences Citation Index[®] (SSCI[®])*.

The essay that follows is an update of my earlier report. We've now streamlined an already streamlined product—a product that was good enough in its original form to win an award but still not good enough for my

tastes. The fact is that once you begin to get used to personal computing, your "patience level" changes rapidly. And so, here we are one year later with a new and improved version of the *SCI*. By way of comparison, remember that the print *SCI* is published each year in 18 volumes, which are now compressed onto a single disc.

As stated above, ISI released the *SCI Compact Disc Edition (SCI CDE)* about a year ago. On that occasion, we discussed the power of CD-ROM technology and its ability to unleash the full strength of citation indexing.³ In addition to highlighting its capacity to search by citation, title word, or author, we discussed the *SCI CDE*'s "related records" feature. This search capability permits you to search in an unusual way. The related records capability has been described as an application of hypertext technology.⁴ It allows you to identify almost instantly the closest "neighbor," on the basis of shared references, to any given record. The related records feature provides unique versatility in literature searching.

It is gratifying to acknowledge that the *SCI CDE* has been very favorably received. For example, it was selected as the Product of the Year by *Laserdisk Professional* magazine. Robert Michaelson described it as "the first bibliographic CD-ROM product I have seen which is not just a search aid, but a true interactive research tool."⁵ Michaelson is head librarian at the Seeley G. Mudd

Library for Science and Engineering, Northwestern University, Evanston, Illinois.

Needless to say, there is always room for improvement. Early this year we set out to develop an enhanced version of the *SCI CDE*, taking into account not only the latest advances in CD-ROM and software technology, but also the comments and suggestions from the test sites and customers of the original release. The result is Version 2.0 of the *SCI CDE*, to be released this month. Like its predecessor, this new version offers access to over 3,300 of the highest impact science journals covering 100 disciplines. The updated version, however, provides several enhancements. These include faster search and retrieval, more efficient storage of data on a single disc (unlike the two required for the original version), and the ability to use networked or multiple CD-ROM drives. Table 1 summarizes the main features of Version 2.0.

Simultaneous with the upgrade of the software, we have achieved another goal in our CD-ROM plans. The *SSCI Compact Disc Edition (SSCI CDE)* is now available. The identical software has been combined with the *SSCI* database to give you compatible searching of 1,400 fully covered social-sciences journals, representing over 60 disciplines (as well as selective coverage of the 3,300 science journals in the *SCI* database). Search results from the two databases are completely compatible.

Creating, Running, and Saving Searches

The *SCI CDE* and *SSCI CDE* allow you to access data by title word, source author's name, author's address, journal title, and citation (including cited patents). As in the original version, you can enter terms directly or select from extensive dictionaries. With the new version, however, this process is smoother and more integrated. Using the "Alt-F" key combination, you first select a field ("title," "author," "citation," etc.). If you choose, you can then enter your own terms. Figure 1 is a screen display of this feature. Field selection can be changed at any time.

Table 1: Main features of Version 2.0 of the *SCI*[®] *CDE* and the *SSCI*[®] *CDE*.

New Look

- one compact disc per index period
- can operate on multiple drives and CD-ROM network systems
- faster search speed

Searching

- one integrated search mode
- limit searches to document type, language, latest update period
- save search queries to diskette and rerun as a "profile"
- search queries scrollable, no recall needed to see articles from previous searches

Results

- > shows authors and titles in upper- and lowercase
- > shows full titles on title scan
- > shows addresses, references, and related records from both a title scan and full record display
- > creates numbered sets of collected or related records with "MakeSet" option
- > performs citation searches directly from a record's reference display
- > displays, prints, or saves any number of records
- > saves records to diskette in any of several file formats
- > displays references, addresses, and related records of collected records

If you wish, you can also use the "Alt-D" keys to summon dictionaries from which items can be selected. Figure 2 shows a typical display from the title-word dictionary, including terms and associated number of occurrences. It is also easy to search multiple fields by combining results of queries into their own set. Suppose, for example, that you would like to find an article on sarcoma that you remember scanning in *Nature*. You could enter "sarcoma" in your first query and the journal *Nature* in your second. Using the "set" field to combine sets 1 and 2 in your next query would produce any articles from *Nature* with "sarcoma" in the title. Using the logical operators "AND," "OR," and "NOT," it is possible to introduce a variety of relationships between multiple search terms and set numbers.

Version 2.0 allows you to limit your search statement by language, document type, and update period. For example, you may want to limit your search by language, seeking only articles written in German, say,

or Japanese. Among the document types you can select are articles, book reviews, editorials, corrections, and hardware and software reviews. Limiting by update period will ensure that you only see records added to the database since the last quarterly update; this is useful if you execute search pro-

files periodically and want to avoid duplicate results.

Closely related to this feature is another key enhancement in the new version: the ability to save search profiles of up to 50 queries. These profiles can then be run as searches on back files, on the latest update,

Figure 1: Searchable fields as displayed by the *SCI*[®] CDE and the *SSCI*[®] CDE.

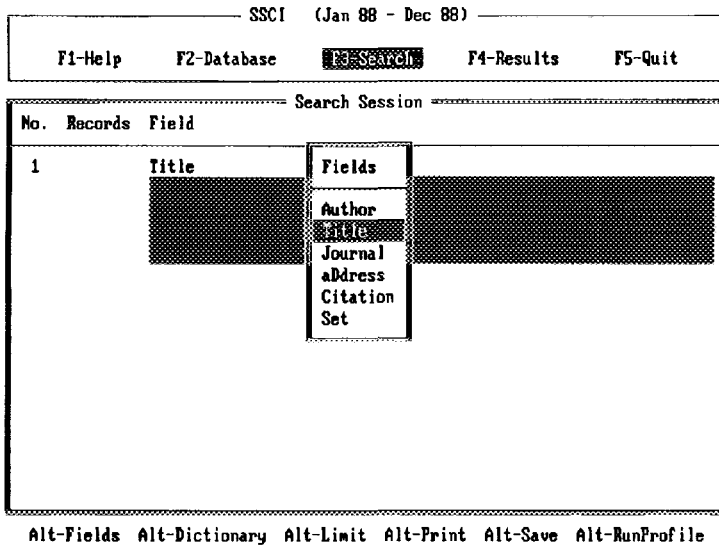
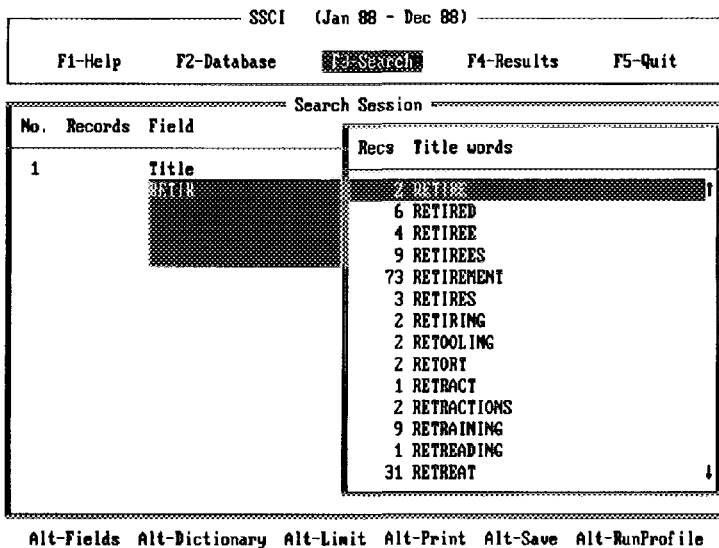


Figure 2: Excerpt from title-word dictionary.



or on other ISI compact disc products. This eliminates the need to recreate queries each time you initiate a search.

Displaying Results

Flexibility in the display of search results is an important aspect of searching. Version 2.0 provides a variety of display options. You can display complete records, including authors, title, full bibliographic information, as well as number of cited references and related records, as shown in Figure 3. You also have the option of simply displaying titles. The enhanced version displays complete titles. Figure 4 demonstrates the title-only display. Note that the titles appear in upper- and lowercase letters.

In displaying records, Version 2.0 offers several options, which represent some of the most powerful and versatile features of the program. The "related records" feature employs the principle of bibliographic coupling to locate articles that share cited references with the record at hand. Up to 20 related records can be displayed at the first level of the search. This feature helps you identify other relevant papers—regardless of whether the articles have any title words in common.

Figure 5 is a scaled-down demonstration of related records (not corresponding, in this

case, to any actual screen display), showing articles by J.M. Hogarth and R.F. Boaz. As the highlighting denotes, both papers cite articles by R. Burkhauser and G.S. Fields. It is these shared references that establish the relationship between the Hogarth and Boaz papers. Although their title words are dissimilar, both papers deal with the financial implications of early retirement. Conventional indexing or search strategies might miss such a connection.

Figure 6 demonstrates how Version 2.0 actually displays a related record. The "parent" paper by Hogarth is briefly identified in the upper portion of the screen, while the first of 20 related records—the Boaz paper—is displayed in full.

Once you've located an interesting related article, you can then find the related records for it—which may lead to other more pertinent papers. For example, were you to now request the related records for the Boaz paper, the right-hand corner of the screen display would indicate that you were at "Level 2" of the parent paper by Hogarth. Five levels of related records can be examined.

A new feature of the "related records" display is the "MakeSet" option (at the lower right of the display in Figure 6).

Figure 3: Display of full record.

```
----- SSCI (Jan 88 - Dec 88) -----
F1-Help   F2-Database   F3-Search   F4-Records   F5-Quit

----- Records: 1 of 57 ----- (Set 1) -----
Hogarth-JM
Accepting an Early Retirement Bonus - An Empirical Study (English)
=> Article

JOURNAL OF HUMAN RESOURCES
Vol 23 No 1 pp 21-33 1988 (M3392)

Related Records: 20  References: 8

-----
Related  ReReferences  Addresses  Collect  Print  Save
```

“MakeSet” is useful for refining and narrowing your search results. By selecting this option, you can automatically create a set of related records, which will then be included in your search session. This set can be combined with others by using set numbers and logical operators. For example, you could make a set of related records and then restrict the results to articles published only

in certain journals. To do this, you would first use “MakeSet” to create a set of related records. In your next query, you would enter the “journal” field to create a set containing the titles of one or more selected journals. Using the operator “AND” to combine these two sets in your next query will identify any of the related items that appear in the specified journals.

Figure 4: Title-only display.

SSCI (Jan 88 - Dec 88)

F1-Help F2-Database F3-Search **F4-RESULTS** F5-Quit

Records: 1 of 57 (Set 1)

Accepting an Early Retirement Bonus - An Empirical Study

Retirement Incentives Contained in Occupational Pension Plans and Their Implications for the Mandatory Retirement Debate

The Future of Work and Retirement

Incidence, Timing, and Events Associated with Poverty - A Dynamic View of Poverty in Retirement

Related References Addresses Collect Print Save

Figure 5: Illustration of related records, showing references shared by the R.F. Boaz and J.M. Hogarth papers.

RELATED RECORDS

Hogarth-JM
 Accepting an Early Retirement Bonus - An Empirical Study
 J Human Resources, 23, 21-33 (1988)

References:
Mirakauer-R 1988 Ind-Labor-Relations V37 P484
Fields-GS 1984 Retirement-Pensions
 Gustafson-TA 1982 Thesis-Yale-U
 Gustman-AL 1984 Ind-Labor-Relations V37 P403

Boaz-RF
 Early Withdrawal from the Labor Force - A Response Only to Pension Pull or Also to Labor-Market Push?
 Research on Aging, 9, 538-547 (1987)

References:
Mirakauer-R 1988 Ind-Labor-Relations V37 P484
Fields-GS 1984 Retirement-Pensions
 Mincer-J 1981 Study-Labor-Markets

The Cited References Option

Whenever I have done searches and retrieved a list of cited references, I've wished that I could avoid rekeying the references to continue searching with those that interested me most. By using the "References" option at the bottom of the screen, activated by pressing the letter "F," you can view the cited references for any displayed record on screen. As Figure 7 indicates, the references appear in condensed format—primary author, year, journal title, volume, and pagination. But there is more. Now, you also have the option to do a cited work search instantly on any of these displayed references. This eliminates having to go back to the "citation" dictionary. Just highlighting the desired reference and pressing the return key will retrieve any articles in the database that have cited the selected item. The resulting records can then be examined or saved like any others.

Author Address

When searching and selecting articles, it is useful to have access to author addresses, which Version 2.0 provides instantly. To

display the addresses of a given article's authors, you use the "Addresses" option shown in Figure 8. The first author's address appears first in the resulting display; it may be followed by alternative addresses for the first author or the addresses of the paper's coauthors. You can store this information for reprint requests. However, you can also use the address list to do searches by institution. Thus, you can keep tabs on what is published at a particular company or university.

Using the "Collect" feature, it is possible to create or add to your own "custom" subset of selected records for printing or saving to an export file. You have the option of adding to the collection only the currently displayed article or all the records in the set. Related records can be collected as well. A major advantage in the new version is that collected records can be viewed with full functionality—that is, you can instantly summon addresses, references, and related records for any paper retrieved. This greatly expands your ability to seek out and identify pertinent articles (the "MakeSet" option also applies to collected records).

The "Save" option lets you save search results to a file suitable for export to a file-

Figure 6: Display of a related record.

```
----- SSCI (Jan 88 - Dec 88) -----
F1-Help  F2-Database  F3-Search  F4-References  F5-Quit
Record: 1 of 57
Hogarth-JM  Accepting an Early Retirement Bonus - An Empirical Study

----- Related Records: 1 of 28 ----- (Level 1)
Boaz-RF
Early Withdrawal from the Labor Force - A Response Only to Pension Pull
or Also to Labor-Market Push (English) => Article
RESEARCH ON AGING
Vol 9 No 4 pp 538-547 1987 (L8671)
Related Records: 13  References: 38  Shared References: 2

-----
Related  References  Addresses  Collect  Print  Save  MakeSet
```

management program or word processor. The new version offers considerably more options in saving, letting you specify how much information you want included in each saved record. For example, you can select a "short record" form, which includes all

bibliographic data, the number of related records, and the number of references. You can choose to include additional items, such as author addresses and the item's complete reference list. In addition, the program offers a selection of formats in which to save

Figure 7: Display of references cited in paper by J.M. Hogarth.

SSCI (Jan 88 - Dec 88)

F1-Help F2-Database F3-Search **References** F5-Quit

References: 8 Press **↓** to search on reference.

Hogarth-JM Accepting an Early R => Article JOURNAL OF HUMAN RES Vol 23 No 1 pp 21	BURKHAEUSER-RU-1979-J-HUMAN-RESOURCES-U14-P63 DURMOUCHEL-WH-1979-MIT13-DEP-MATH-TECHN FIELDS-GS-1984-J-HUMAN-RESOURCES-U19-P245 FIELDS-GS-1984-RETIREMENT-PENSIONS GUSTAFSON-TA-1982-THESIS-YALE-U GUSTMAN-AL-1984-IND-LABOR-RELATIONS-U37-P403 HOGARTH-JM-1984-RFB43-CORN-U-COMS-EC
---	--

Related Records: 20 References: 8

Related References Addresses Collect Print Save

Figure 8: Display of address for author J.M. Hogarth.

SSCI (Jan 88 - Dec 88)

F1-Help F2-Database F3-Search **Addresses** F5-Quit

Addresses: 1 Press any key to continue.

Hogarth-JM Accepting a => Article JOURNAL OF Vol 23 No Related Rec	CORNELL UNIV, NEW YORK STATE COLL HUMAN ECOL, ITHACA, NY 14853, USA
---	--

Related References Addresses Collect Print Save

records. You can select a plain text (ASCII) format; a "tagged" format in which fields are labeled with a two-letter code; the "Pro-Cite" format, a comma-delimited format that can be used by Pro-Cite,⁶ dBase III, and other database managers; and the NLM-Medline format, in which fields are tagged and journal information is restricted to one line.

Conclusion

This essay has highlighted several of the enhancements in the software for the *SCI* and *SSCI* on compact disc. To reiterate: the new software features drastically improved search and retrieval time. Data for one year are now stored on a single disc, eliminating the need to switch discs within the same year. Lastly, Version 2.0 can be used with multiple-drive and networked CD-ROM equipment.

With these enhancements, we believe we've made an excellent product even better. At the outset of this essay, I stated that

the ideal information retrieval system would be one that would provide real-time, instantaneous access to all the world's published literature. While such a system may still be beyond our reach, products such as the improved *SCI CDE* and its new social-sciences counterpart (*SSCI CDE*) are surely bringing us closer. As I told editor Nancy K. Herther of *Laserdisk Professional* in an interview published in July, CD-ROM technology is clearly part of the wave of the future.⁷ The technology of laserdisk storage has already advanced to the point where one can visualize even greater storage capacity on the disc. This will undoubtedly parallel the change in capacity we've witnessed in the rapid evolution of the integrated chip and the PC itself.

* * * * *

My thanks to Christopher King, Marjorie Little, Richard Lowe, Gary Schwartz, and Anita Wagner for their help in the preparation of this essay.

© 1989 ISI

REFERENCES

1. Wells H G. *World Brain*. Garden City, NY: Doubleday, 1938. 130 p.
2. Bush V. As we may think. *Atlantic Monthly* 176:101-8, 1945.
3. Garfield E. Announcing the *SCI Compact Disc Edition*: CD-ROM gigabyte storage technology, novel software, and bibliographic coupling make desktop research and discovery a reality. *Current Contents* (22):3-13, 30 May 1988.
4. Cawke T. Advances in hypermedia. *Electron. Libr.* 7(4):242-4, August 1989.
5. Michaelson R. *Science Citation Index* on CD-ROM. *Laserdisk Professional* 2(1):69-70, January 1989.
6. Fuller S. Pro-Cite: for bibliographic databases and bibliographies. *Information Today* 5(9):11; 14, October 1988.
7. Herther N K. Bringing citation indexes to CD-ROM: an interview with Eugene Garfield. *Laserdisk Professional* 2(4): 25-32, July 1989.

Trial copies of the *SCI*[®] *CDE* and the *SSCI*[®] *CDE*, containing data for the first half of 1989, are available now. Beginning this month, we will be ready to ship discs containing annual cumulations, as far back as 1986, for both databases. Current *SCI CDE* subscribers will receive upgrades of their holdings free of charge. To order a trial copy of the *SCI CDE* or the *SSCI CDE*, or for more information, contact ISI[®]'s Customer Services Department toll-free at 800-523-1850, extension 1405. A special end-user pricing policy is available. Contact your regional sales representative or ISI for details. Outside the US and Canada, contact the nearest representative listed on the inside front cover of this issue of *Current Contents*[®].