in the record and their respective starting positions. The directory is constructed by computer based on cataloging information.” (24)²

Perhaps the book is best suited for self-study by those who already have cataloging expertise but want to learn more about cataloging specialized formats and electronic resources. Even they may be disappointed because Hsieh-Yee tends to mention a new technology or means of providing access without going into enough detail to be useful. More explanation of new terminology would be helpful, and a glossary would have been a useful addition to the text.

The suggested readings at the end of each chapter and the extensive bibliography of both print and online resources are helpful sources for further information. In addition, a textbook supplement “to facilitate access to important cataloging tools and recent updates on the treatment of audiovisual and electronic resources” (xiii) is available from the publisher’s Web site, at www.lu.com/textsuppl.html. Author/title and subject indexes are included but are sometimes confusing; for example, CORC Project is listed under author/title but not in the subject index.

Hsieh-Yee does not improve on or add to Nancy Olson’s classic work, Cataloging of Audiovisual Materials, which, for its fourth edition, added “and Special Materials” to its title and now includes guidance on cataloging electronic and Internet resources. Perhaps if Hsieh-Yee had not added the subtitle “A Cataloging Guide” to her book, I would not have been so disappointed in it.—Linda Behrend (behrend@astec.lib.utk.edu), University of Tennessee-Knoxville Library.

Works Cited


This volume celebrates fifty years of trailblazing in user access to information. The title is a reference to “Save the time of the reader,” the fourth of Shyali Ramamrita Ranganathan’s five laws. In 1970 Pauline Cochrane gave a series of lectures in India in which she offered an American view of Ranganathan’s laws (Atherton 1973). There she identified the need for research to match the user’s need with the structure of information resources, as reported by Linda C. Smith in this volume (100), so that catalogs that save the time of the reader could be constructed to reflect human search behavior. Twenty years later Cochrane again considered Ranganathan’s laws, this time as criteria for information technology assessment (Cochrane 1992), and the need to demonstrate that a system “improves the timeliness, precision and comprehensiveness of information provision to users” (100). One of the few women conducting research in the 1950s, Cochrane was denied the doctorate because the statistical validity of her innovative user-evaluated relevance studies was questioned (65, 77). The topic was controversial in the politically charged environment surrounding the introduction of automated information retrieval systems, often supported by large federal grants. Undaunted, she persevered and produced an enduring legacy of publications and outstanding students. The underlying focus of her research and teaching has been the goal of establishing empirical methods to enhance end-user subject access.

Some of Cochrane’s remarkable early research projects are described by her long-time colleague Donald King in “Blazing New Trails: In Celebration of an Audacious Career.” In studies undertaken for the American Institute of Physics (AIP) in the early 1960s, she looked beyond the severely limited capabilities of the available systems to examine the formulation of search queries as though an “ideal information retrieval system” were in place (60). Previously, user expectations were constrained by these limitations. Analysis of 5,000 active search requests obtained from a questionnaire sent to physicists allowed her to develop a comprehensive approach to respond effectively to the institute’s actual needs (Atherton and Borko 1965). Author participation was introduced through “Aid-to-Indexing” forms completed before publication. These AIP studies flew in the face of government-contracted automation vendors’ approach to system development. At a time when batch-processing retrieval was the norm, Cochrane’s evaluation of an interactive Universal Decimal Classification-based system (dubbed AUDACIOUS) demonstrated vastly enhanced efficiency by combining the hierarchical and multifaceted classification with the controlled vocabulary index from the Nuclear Science Abstracts (Atherton, King and Freeman 1968). Interactive classification research weighed precision against recall in assessing the “cost” required to achieve various levels of recall—and pointed the way to relevance feedback. The Syracuse University Psychological Abstracts Retrieval System (SUPARS) provided online free-text searching of titles and abstracts. SUPARS was accessed by remote telecommunication terminals located across the campus. Assistance
was provided to users by telephone, three-quarters of whom had never
used a computer before. Half reported
successful retrieval even though at the
time only two years of abstracts were
available (Atherton 1971). Cochrane's
scorned dissertation research sought
to achieve a replicable, statistically
valid experiment to evaluate a key
process in document retrieval. It
involved searches of a test bed of doc-
uments reviewed by proxy users to
determine their relevance to each
query. Intermediaries screened the
search outputs using various types of
indexing, including natural and con-
trolled vocabulary. Precision and recall
of the retrieved document sets were
scored against the relevance previously
identified by the users. Unlike pre-
vious work, such as that of Cyril
Cleverdon and the Cranfield group,
this experiment demonstrated the pos-
sibility of quality control for screening
accuracy based on user-relevance
judgment (65).

In the 1960s and 1970s, there was
an explosion of information retrieval
research, largely funded by federal
agencies, with much competition
among system design approaches.
Evaluation methods were a critical
issue in the battle for funding. These
debates revolved around defining
and measuring relevance. Crucial to the
evolving model for system-accuracy
assessment was the derivation of con-
tditional probabilities from various
observed relevance values. Cochrane's
unique approach had produced two
conditional-probability data concern-
ing screening options, which were
incorporated into standard models
(72).

The in-depth evaluations of the
AUDACIOUS and SUPARS projects
were among the first, and for some
time the last, such studies of an oper-
ational, interactive, online system.
Lavish government funding had pre-
cipitated a highly competitive and con-
tentious period of development in
information retrieval, but by 1980, the
funding dried up: and the work that
had been done became virtually
unknown until the advent of wide-
spread Internet use. After another
twenty years, digital-library initiatives
have led us to rediscover information-
retrieval research, only to reinvent
rather than to build upon the knowl-
dge edge abandoned only a few years
before (77). Although her early work
was all on the cutting edge at the time,
the issues Cochrane identified eerily
foreshadow life as we know it in aca-
demic libraries today. One cannot help
but wonder how much we have really
learned in the last fifty years.

In "Obstacles to Progress in
Mechanized Subject Access and the
Necessity of a Paradigm Change,"
Robert Fugmann identifies false
assumptions upon which current sub-
ject access research is predicated.
As information technology has pro-
gressed, parallel achievements in sub-
ject access have not. The ability to
provide unsatisfactory responses faster
and cheaper has in fact undermined
them (8). He attributes these to the
inherent flaws of an overly positivist
philosophy. The uncritical acceptance
as empirical law of an "inverse rela-
tion between precision and recall"
(15) is debunked as an apparent
excuse for inadequate systems.
Failures in precision are attributed to
poor representational fidelity from an
absence of specificity in, or unreliable
application of, the indexing language.
Predictability, the ability of the
searcher to select valid search terms in
data storage and retrieval controls,
the effects of "input parsimo-
niousness" (29) on system failure are
detailed, particularly poor indexing
grammar and vocabulary structure.
Free-text searching of increasingly
large files is exposed (11–15) as a fun-
damental absence of syntactic and
semantic structure, rarely justified by
user satisfaction, often only by
reduced input cost. I have often found
Fugmann's style dense; this is not light
reading. The analysis is trenchant, his
arguments sharply articulated. Extensive
previous literature is cited, if often
his own. The careful reader will be
amply rewarded for the effort.

Looking back twenty-five years to
her initial investigations of mapping
controlled vocabularies in support of
cross-database searching, Linda C.
Smith (one among Cochrane's many
distinguished former doctoral stu-
dents) reviews current developments
and identifies directions in research
needed to fully exploit newer tech-
nologies in her paper "Subject Access
in Interdisciplinary Research." Early
machine-readable databases were
narrowly focused on established disci-
plines and retrieved document-super-
gates from a limited array of controlled
vocabulary descriptors and keywords
from abstracts (101). Not only have
the size and number of databases and
related index vocabularies increased
continually, so too has the diversity of
sophisticated search techniques avail-
able, including full-text searching. The
Internet may be viewed as an immense
multiple-database-retrieval system
lacking in unified access tools.
Various possibilities for controlled
vocabulary integration have been
employed, including switching lan-
guages to mediate translation, micro-
thesauri consisting of subsets of
specialized terms extracted from larg-
er sources, and macrovocabularies that
encompass multiple existing languages
into a superstructure (105–106).
Various techniques for cross searching
have been implemented to assist in
database selection, to generate online
catalog displays linking overlapping
subject heading systems such as
Library of Congress and medical sub-
ject headings, to facilitate interdisciplinary
citation indexing and to manually
map multiple vocabularies within a
single large domain such as medicine
or art. Interdisciplinary behavior has
not been adequately documented to
account for the subjectively construct-
ed meaning of search vocabulary
encountered in various contexts.
Classification and thesaurus design must be expanded to conceptualize specific work domains across which searches are conducted (110). New technologies must be exploited to improve the interfaces between users and systems to enhance navigation through large and diverse resources. Information visualization holds great potential as an aspect of system development in the environment of graphic-user-interface software (111). As much as innovations in information retrieval may enhance capabilities for interdisciplinary research, so may the need to support such research serve to reorient theoretical perspectives on knowledge organization.

Not everyone has forgotten the accomplishments of early information science research. Karen M. Drabenstott, another of Cochrane’s former students, contributed to this volume “Web Search Strategies,” a detailed guide to adapting standard information retrieval search strategies to the functionalities of Internet search tools. She makes the distinction between search strategy (or overall plan) and search tactic, a move made to advance the strategy, and identifies the fundamental role of Boolean algebra in the capacity of automated systems to respond to complex queries not possible before the introduction of computers. The complexity of refinement with which these concepts can be applied was a central issue in preparing librarians to search databases and continues to present a stumbling block to end-user searches (128). The half-dozen most frequently used bibliographic database search strategies were first documented in a form widely known among librarians in the training manual for Educational Information Resources Clearinghouse searchers prepared by Drabenstott and Cochrane (Markey and Atherton 1978). Different Internet search tools have developed as the Web grew in size and diversity of file types, with the use of hyperlinks for navigation as the uniquely distinguishing feature known as “surfing the Web.” Initially home pages linked to other pages recommended by the owner, were developed by “trailblazers,” persons expert in a topic who graciously maintain a set of relevant links, into subject directories that systematically guide searchers to sites based on subject content rather than mere personal interest (124). As general and commercial use of the Internet skyrocketed, commercially maintained search engines appeared that continuously retrieve and index large portions of the Web based on words and phrases contained in various portions of the hypertext mark-up language coded files. These are used to retrieve ranked displays in response to search queries. Unless a search is very specific or employs a tightly constructed argument involving Boolean and truncation techniques, search engines routinely retrieve tens—even hundreds—of thousands of citations (126). As the number of search engines proliferated rapidly, meta-search engines appeared to, as it were, search the search engines, either by listing selected search engines with guided query forms for each or by providing a common query form submitted to search engines selected by the metasearch engine based on the terms entered (128). Whereas in the past the searcher’s goal was primarily resource recovery, now the most severe problem is rationally sorting and browsing through large response sets. As Gregory H. Leazer has observed, we now inhabit an information economy of abundance rather than scarcity such that “the scarce resource is no longer the information, but people’s attention spans” (St. Lifer 1999).

Drabenstott creatively maps basic information-retrieval strategies onto the capabilities of the new Internet search tools (129), to present six new search strategies for Web searchers not previously documented. These are explained step-by-step with clever, timely scenarios that characterize actual Web-search user behavior (132-5) and are also charmingly illustrated with Stanley the Squirrel cartoons. Catchy titles for the strategies such as “Shot in the Dark” and “Bingo” epitomize the droll style Drabenstott often uses to good effect in putting across complex, subtle concepts. She draws a marked contrast between Web use and use of early commercial databases that employed a uniformly terse vocabulary, limited to titles or abstracts and thesaurus descriptors. Access was restricted due to the expensive connect time required. Therefore searches were most often performed by a remote intermediary rather than the end user, limiting interaction and relevance feedback within the search process (115–116). What was once the exclusive preserve of professional searches is now open to literally millions in their own homes because of the explosive surge in access provided by the digital revolution. The resonance with Cochrane’s analysis of the user component of the SUPARS project involving interactive, online searches by computer-naive end users now seems truly prescient. In much the same vein, Drabenstott’s startling and yet down-to-earth initiatives will be a valuable contribution to bibliographic instruction and digital literacy programs.

Other contributors Raya Fidel, Bjorn Tell, Vinh-The Lam, and Eric H. Johnson present papers built on concepts and methods that Cochrane pioneered. Indeed Pauline Atherton Cochrane is a trailblazing woman, whose life and work are to be celebrated for bringing the helping profession values of librarianship to the high-tech world of online information. Her accomplishments have been far ahead of her time and their relevance has grown exponentially.—J Bradford Young (jbyoung@pobox.upenn.edu) University of Pennsylvania Libraries, Philadelphia.
Works Cited


Index to Advertisers

Archival Products ..................................................122
BWI ................................................................. cover 4
Library Technologies, Inc. ........................................... cover 3
Net Library ........................................................... 148–149
OCLC ................................................................. cover 2