KNOWLEDGE ORGANIZATION

Guest Editorial
McIlwaine, I.C. and Broughton V. The Classification Research Group – Then and Now .................................. 195

Articles
Andersen, J. Written Knowledge: A Literary Perspective on Indexing Theory .................................................. 201
Saarti, J. Taxonomy of Novel Abstracts Based on Empirical Findings ............................................................ 213
Satija, M.P. Library Classification: An Essay in Terminology ........................................................................... 221

FID/CR News 51
Derek Langridge ................................................................................................................................................. 230
Universal Decimal Classification ...................................................................................................................... 230
Other UDC publications .................................................................................................................................... 232
IFLA Section on Classification and Indexing ..................................................................................................... 232
National Activities in Classification and Indexing as Reported at IFLA ........................................................... 234
The Bliss Bibliographic Classification .............................................................................................................. 234
Classification Research Group .......................................................................................................................... 235

Book Reviews

Knowledge Organization Literature
27(2000)No.4 .................................................................................................................................................. 244

Personal Author Index
27(2000) ......................................................................................................................................................... 254

**ABSTRACT:** The general concern of Bazerman’s book “Shaping Written Knowledge. The Genre and Activity of the Experimental Article in Science” is written knowledge as it is produced by the academy. Bazerman discusses in particular the rhetoric, communicative, and epistemological issues of written knowledge. The article discusses these themes in a library and information science (LIS) perspective in terms of their implications for LIS research.

For several reasons, it is argued that this way of scrutinizing into written knowledge ought to be of special interest to LIS research. As an example of a particular field of research in LIS, the article discusses the relationship between indexing theory and written knowledge. Bazerman analyzes written knowledge from a literary point of view. Among other things, it is argued that indexing theory can be seen as part of literary theory in that some of the questions raised by the latter are also raised in indexing theory. Furthermore, it is put forward that the indexer can be considered an author. The indexer produces a text, the document representation, which is the text the user actually meets in the first place. That way, the producer of a document representation is to some extent responsible for the quality of the documents indexed.

Having discussed this relationship between written knowledge and LIS research in general and indexing theory in particular, it is concluded that LIS research ought to head toward more humanistic oriented research traditions, if the line of research presented by Bazerman should be considered useful for LIS.


**ABSTRACT:** This paper examines the content description of fictional works, specifically novels. The data for the empirical part of the study was gathered in Finnish public libraries. The aim of the study is to find out how library clients and library professionals of public libraries describe novels by abstracting them – what are differences in their characterisations and what are the similarities between their abstracts. Also, a taxonomy of novel abstracts is given. The abstracts are classified into four categories in the taxonomy: plot or thematic abstracts, cultural-historical abstracts, subjective or personal abstracts and critical abstracts. In the final portion of the paper, a model for a search and retrieval system for fiction is presented.


**ABSTRACT:** Arguing that an established technical terminology is crucial to the development of a discipline, and that classification terminology is neither well settled nor widely used by its exponents, this paper provides an explanation of some of the concepts generally accepted by classification theorists. In particular, the elaborate terminology generated by S.R. Ranganathan is examined. Definitions are provided for numerous concepts, including “classification”; “characteristics” and “attributes”; the genus-species relationship; the types of classes (canonical, systems, special, and environmental main classes); the kinds of subject (basic, compound, complex); as well as concepts such as facets, isolates, arrays, and chains. Comparisons between different classification systems, specifically the Dewey Decimal Classification, Colon Classification, and Library of Congress Classification, are also made.

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KNOWLEDGE ORGANIZATION

Official Quarterly Journal of the International Society for Knowledge Organization

International Journal devoted to Concept Theory, Classification, Indexing and Knowledge Representation

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Examples:


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Scope

The more scientific data are generated in the impetuous present times, the more ordering energy needs to be expended to control these data in a retrievable fashion. With the abundance of knowledge now available the questions of new solutions to the ordering problem and thus of improved classification systems, methods and procedures have acquired unforeseen significance. For many years now they have been in the focus of interest of information scientists the world over.

Until recently, the special literature relevant to classification was published in piecemeal fashion, scattered over the numerous technical journals serving the experts of the various fields such as

- philosophy and science of science
- science policy and science organization
- mathematics, statistics and computer science
- library and information science
- archivistics and museology
- journalism and communication science
- industrial products and commodity science
- terminology, lexicography and linguistics

Beginning 1974, KNOWLEDGE ORGANIZATION (formerly INTERNATIONAL CLASSIFICATION) has been serving as a common platform for the discussion of both theoretical background questions and practical application problems in many areas of concern. In each issue experts from many countries comment on questions of an adequate structuring and construction of ordering systems and on the problems of their use in opening the information contents of new literature, of data collections and survey, of tabular works and of other objects of scientific interest. Their contributions have been concerned with

1. clarifying the theoretical foundations (general ordering theory/science theoretical bases of classification, data analysis and reduction)
2. describing practical operations connected with indexing/classification, as well as applications of classification systems and thesauri, manual and machine indexing
3. tracing the history of classification knowledge and methodology
4. discussing questions of education and training in classification
5. concerning themselves with the problems of terminology in general and with respect to special fields.

Aims

Thus, KNOWLEDGE ORGANIZATION is meant to be a programme for the improvement of classification methods and processes, a forum for discussion for all those interested in the organization of knowledge on a universal or a subject-field scale, using concept-analytical and/or concept-synthetic approaches as well as numerical procedures and comprising also the intellectual and automatic compilation and use of classification systems and thesauri in all fields of knowledge, with special attention being given to the problems of terminology.

KNOWLEDGE ORGANIZATION publishes original articles, reports on conferences and similar communications, the Newsletters of the International Society for Knowledge Organization (ISKO News) and the Committee on Classification Research of the International Federation for Information and Documentation (FID/CR News) as well as book reviews, letters to the editor, and an extensive annotated bibliography of recent classification and indexing literature, covering some 500 items in each issue.

KNOWLEDGE ORGANIZATION should therefore be available at every university and research library of every country, at every information center, at colleges and schools of library and information science, at the hands of everybody interested in the fields mentioned above and thus also at every office for updating information on any topic related to the problems of order in our information-flooded times.

KNOWLEDGE ORGANIZATION was founded in 1973 by an international group of scholars with a consulting board of editors representing the world’s regions, the special classification fields, and the subject areas involved. From 1974-1980 it was published by K.G. Saur Verlag, München. Back issues of 1978-1992 are available from ERGON-Verlag, too. (The 14 volumes of 1978-1992 are offered now at the highly reduced price of DM 200.)

As of 1989, KNOWLEDGE ORGANIZATION has become the official organ of the INTERNATIONAL SOCIETY FOR KNOWLEDGE ORGANIZATION (ISKO) and is included for every ISKO-member, personal or institutional in the membership fee (US $ 55/US $ 110).

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Guest Editorial

The Classification Research Group – Then and Now

by I.C. McIlwaine and Vanda Broughton

The genesis of the Group

In 1948, as part of the post-war renewal of library services in the United Kingdom, the Royal Society organized a Conference on Scientific Information.1 What, at the time, must have seemed a minute part of the grand plan, but was later to have a transforming effect on the theory of knowledge organization throughout the remainder of the century, was the setting up of a standing committee of a small group of specialists to investigate the organization and retrieval of scientific information. In 1950, the secretary of that committee, J.D. Bernal, suggested that it might be appropriate to ask a group of librarians to do a study of the problem. After a couple of years of informal discussion it was agreed, in February 1952, to form a Classification Research Group – the CRG as it has become known to subsequent generations.

The Group published a brief corporate statement of its views in the Library Association Record in June 19532 and submitted a memorandum to the Library Association Research Committee in May 1955, entitled “The need for a faceted classification as the basis of all methods of information retrieval”. This memorandum was published in the proceedings of what has become known as the “Dorking Conference” in 1957.3 Of the original fifteen members, four still belong to the Group, three of whom are in regular attendance: Eric Coates, Douglas Foskett and Jack Mills. Brian Vickery ceased attending regularly in the 1960s but has retained his interest in their doings; he was present at the 150th celebratory meeting in 1984 and played an active part in the “Dorking revisited” conference held in 1997.4

The stated aim of the Group was

“To review the basic principles of bibliographic classification, unhampered by allegiance to any particular published scheme”

and it can truly be stated that the work of its members has had a fundamental influence on the teaching and practice of information retrieval. It is paradoxical that this collection of people has exerted such a strong theoretical sway because their aims were from the outset and remain essentially practical. This fact is sometimes overlooked in the literature on knowledge organization: there is a tendency to get carried away, and for researchers of today to concentrate so hard on what might be that they overlook what is needed, useful and practical – the entire objective of any retrieval system.

Classifications, special to general

At the time when the Group came into being all the general schemes of classification were suffering from neglect. Little attention had been paid to any of them since the 1930s (though the 14th edition of DDC was published in 1942) and from a British per-

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2 LAR June 1953, 187-188.
4 Knowledge organization for information retrieval: proceedings of the sixth international study conference on classification research, held at University College London, 16-18 June, 1997 (FID 710), The Hague, FID, 1997.
spective none was seen as of great use for the organization either of scientific and technical books, or of general collections with a British perspective. In those days there was no standardization or common practice of book arrangement in the UK. Many academic libraries operated on a fixed location system, there was little provision for subject access and by no means all public libraries used Dewey – the Subject classification of James Duff Brown had a strong following (and remained in use by some until the mid 1970s).

Nevertheless, it was to the needs of specialized, and frequently technical, collections that the Group first turned its attention. This is hardly surprising, given the institutions from which the membership was drawn – the Dept of Scientific & Industrial Research, Tate & Lyle, Metal Box,ICI, the Gas Council and the Patent Office, to name but a few. Initially, it was to special classifications that the Group turned its attention, including, throughout the 1950s and early 1960s, a series of special schemes all based on facet analysis, and concentrating principally on highly specialized, technical fields. In the mid 1950s Barbara Kyle, Librarian of the Royal Institute for International Affairs, joined the Group. She was responsible for the classification used in the arrangement of the bibliographies produced by the International Social Science Committee, and her presence had the effect of extending the interests and discussions of the Group beyond discrete specialized subject fields into the much larger group of disciplines that comprise the Social Sciences. Debate now included such problems as difficulties of terminology, cultural differences and the traditions and historical background to the political and legal framework of different parts of the world.

It is hardly surprising, therefore, that within a decade, the Group widened its horizons yet again, and responded in 1962 to the NATO Science Advisory Committee’s report on ‘Increasing the effectiveness of Western science’ which suggested that a new classification for the sciences was needed. The Group applied for and was awarded a grant to conduct a pilot project. Work on the development of a general scheme of classification occupied the members’ attention throughout the 1960s and into the early 70s. The classification per se never saw the light of day, but the ideas and discussions of the Group bore fruit in the PRECIS system of indexing devised by Derek Austin and used by the British National Bibliography until the advent of computerization brought faster, cheaper and less labour-intensive (and far less effective) approaches to subject retrieval in a national bibliographic listing.

Published work

As a Group, the CRG has published little, and it has always been the activities of individual members that have been subjected to rigorous examination at their meetings. Nevertheless, they have been responsible for a number of milestones in the development of classification theory and in the movement towards Knowledge Organization as the preferred label for the activity in which its participants indulge. The first of these was the Dorking Conference held in 1957, which is regarded as a landmark in the development of the subject. A collection of papers, together with recollections from a number of participants, was published in 1997 to accompany the FID/CR 6th International Study Conference on Classification Research (Dorking having been the first in the series). Dorking was followed in 1963 by another conference on “Some problems of a general classification scheme,” financed by the NATO grant and again attended by prominent members of the Group, including some from overseas, such as Pauline Atherton (now Cochrane), de Grolier and Wahlin. The publication resulting from this is a small pamphlet, often overlooked nowadays, but contains some far-reaching proposals. Two years previously the Library Association had published a monograph containing a number of contributions by members of the Group, The Sayers Memorial Volume. Apart from the proceedings of the two conferences and this Festschrift, a series of Classification Research Group Bulletins has been published.

5 These were produced between 1950 and 1955 as periodical publications covering Politics, Economics, Sociology and Anthropology. They were taken over by Unesco in 1960 and have subsequently been taken over by other publishers and have adopted a different subject arrangement.

9 Supra, 4.


lished, numbers 4-12 appearing in the *Journal of documentation*. This collection of publications constitutes the corporate production of the Group.

It is therefore worth considering why such a small amount of literature has had so profound an influence on the thinking of later generations. Firstly, as Jonathan Furner pointed out in his paper at the Toronto ISKO Conference, if one undertakes a literature search on the names of individual members of the group, the results are astronomical. Yet, a search on "Classification Research Group", in the British Library catalogue reveals five items, the papers of the two conferences referred to, a collection of papers from meetings held between 1960-68, and two other incidental items. This small group of librarians, some of whom encountered Ranganathan during World War II when they were serving in India, were profoundly influenced by him, and events of the late 40s and 50s conspired to bring them together and form a group that provided a sounding board for the diverse ideas of a number of individuals. A glance through those CRG bulletins (which provide bibliographies of the members’ writings over the periods covered 1964-85) demonstrates the range as well as the large body of publication generated by these people.

**Educational influence**

Standard works that have been used and recommended to generations of students, include Palmer and Wells’ *Fundamentals of library classification* (1951), Mills’ *Modern outline of library classification* (1962), and the three volumes in the Butterworths series *Classification and indexing* covering science, social science, and the humanities, which appeared through the late 50s to the mid 70s by Vickery, Foskett and Langridge remain classics of the discipline. Many members of the Group were teachers, often for substantial parts of their careers – Vickery, Mills, Foskett, Langridge, Farradane, Morgan, Redfern, Hansen, Cochrane and from later generations Williamson, Svenonius, McIlwaine, Edkins and Broughton, to mention but a few. These standard works, coupled with the teaching of the fundamental principles that are embodied in them and that are the enduring feature of the Group’s work, have been transmitted to students for half a century, so that today many teachers as well as students are unaware of the origin of the ground rules which they instil in their pupils.

**Basis of today’s theoretical principles**

In an age when standardization is the norm, it is easy to forget that this was not the case in the early 1950s. Though many of the “standard” practices which have been adopted today conflict sharply with the Group’s dearly held principles, nevertheless, many of the principles which they both preached and practised are taken as read and adopted almost unconsciously by the information world. Even the Dewey Decimal Classification, for years the butt of group discussions, recommends the implementation of the “standard citation order” in its “Tables of preference” even though it does not use the term. Indeed, DDC embodied all the basic thinking that Coates put into his *British Catalogue of Music Classification* in 1957, in the revision of class 780 introduced some thirty years later in the 20th edition (1989). The work that Jean Aitchison undertook in devising the original English Electric classification, later developed into the Thesaurusfacet, led to the production of the standard work on thesaurus construction, a work that has gone into its 4th edition this year. The *Current technology index* was the product of Coates’ many years experience, just as half a century ago another member of the Group, A.J. Wells, was responsible for the inception of the *British National Bibliography*. The BC2, which might be described as the life work of Jack Mills, is the subject of the later part of this article, but it is also, in some respects, the survivor of the NATO pro-

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ject and the aspirations of the 1960s that the Group might produce a new general scheme of classification.

One of the contributors to the Festschrift produced on the occasion of Group member Pauline Cochrane’s (formerly Atherton) 70th birthday suggests that there is a “disconnect” between the research conducted in the 1960s and 1970s and current activity, and that the work of today is the poorer for not being aware of what has been undertaken in the past. The writer suggests that this is in part due to lack of funding and in part due to the fact that much of the work that was undertaken at that time was written up as research reports (the Aslib-Cranfield tests are a case in point) that are difficult to trace or only held by libraries in microform. Additionally, it is suggested that in the 1980s there was a reversal of opinion about the value of research carried out in the immediate past, and that much of the valuable work undertaken at that time has now fallen into oblivion.

Another factor may be closely linked with the commitment of the Group to practical applications, since the manifestation of much of their efforts is in specific systems and schemes (and indeed many of these not even published independently, such as PRECIS, and Eric Coates’ work on the subject headings in Current Technology Index). This absence of ‘pure’ research may also account for the low number of publications in the form of papers and journal articles.

Bliss Bibliographic Classification, edition 2

A clear example of this kind of largely unrecorded effort occurs in the Group’s contributions to the revision of the Bliss Bibliographic Classification (BC2). BC2 embodies many of the principles developed by the CRG in the creation of special classification schemes and indexing systems during the 1960s and 1970s, namely the organization of vocabulary using rigorous facet analytical principles, the imposition of standard citation order, schedule inversion, and the use of a fully faceted and synthetic notation.

Indeed, it is true to say that BC2, although it follows the general pattern of the original Bibliographic Classification and embodies many of the distinctive theoretical principles of that system, is in essence the new general classification scheme built on facet analytical theory envisaged by members of the CRG from its early days. A powerful argument against the often advanced view that BC2 is the work of an individual (Jack Mills), is the active involvement of many other members of the CRG, whether directly, as authors of individual parts of the classification, or in contributing to the group discussion of general principles affecting the classification of subjects and disciplines, and in the critical evaluation of draft schedules. The most recently published volume of BC2 confirms this, stating that “we are pleased to acknowledge the valuable contribution made by friends and colleagues in the Classification Research Group. CRG discussions have been a constant help and stimulus in designing the schedules.”

Embryonic BC2 can be seen in earlier work of the Group, notably the scheme for Library and Information Science constructed in 1972, and used in the Library Association Library until its departure from the LA, and in Library and information science abstracts (LISA) until 1993. Although the notation is somewhat different in appearance, the structure of the CRG scheme is essentially that of the penultimate draft schedule for Class Z of BC2.

Work on new BC2 schedules, in terms both of original research, and of evaluative feedback, has dominated the CRG during the 1990s. From within the membership, Douglas and Joy Foskett produced a third edition of Bliss Class J, Education, but undoubtedly the principal focus has been on the sciences, where Eric Coates has been the major player, drawing on his experience with the British Technology Index (later Current Technology Index), and in the development of the Broad System of Ordering. His input has been central to Classes AY/B, General Science and Physics, and C Chemistry, and with the publi-
cation of Physics and the virtual completion of Chemistry, he is now working on the Technology class, which has been hanging fire awaiting the final structure of the pure science classes.

The legacy of the Classification Research Group

It could be said that the current concern with BC2 has impeded the forward movement of the Group in other directions. The desire to see the principles of facet analysis made manifest in a specific system of classification may have restricted the wider view of their applicability to a range of indexing and retrieval contexts. It has always been a primary objective of the CRG that its work is founded in practical classification, and in the application of theory to specific situations; it may be that in the 21st century the understanding of the situations to which the theory is appropriate needs re-examining and restating.

Recently the Group has sought to define its aims and objectives in the new century. Current thinking on future directions seems to focus on two issues – firstly, the lack of awareness of classification and indexing theory within the wider library community, and the need both to record and to disseminate this knowledge; and secondly the way in which theoretical principles can, and should, be applied to new information environments, principally the World Wide Web and the management of resources thereon.

There is evidence of a renewed interest in the theory of facet analysis, and in the work of the CRG. But those who come more lately to the field of classification research, while acknowledging the enormous importance of facet analysis as the basis of modern classificatory theory, do not necessarily share an understanding of the information culture of the mid-20th century, when the compelling issues for classificationists were the physical organization of document collections and the attendant problem of representing complex subjects in a linear sequence.

The concept of ‘facets’ as an aid to electronic information retrieval is currently much discussed in professional circles. Indeed, faceted classification sometimes seems to be the buzzword of the 21st century; ontologies and knowledge structures proliferate, many of them constructed by individuals with little or no background in information work, and consequently no knowledge of the tradition of classification theory. All the precision and elegance of systems created in the latter part of the twentieth century seem lost to this audience, and most younger members of the library community are not equipped to rectify the situation. It is desirable that awareness of these techniques and the developed theory should be brought to a wider audience, particularly in view of the indexing and retrieval problems occasioned by electronic dissemination of information, which these techniques are so eminently equipped to address. A recent article states that “...facet analysis can be used to optimise the information retrieval interaction by taking into account both the objective characteristics of the WWW materials and the subjective needs of the searcher. ...Other information retrieval techniques may not do this...”

It is therefore now appropriate to confirm that original objective of the Classification Research Group, namely, “the need for a faceted classification as the basis of all information retrieval”.

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28 A recent CRG meeting sought to define the aims and objectives of the Group. These are stated in Minute 2839 Unconfirmed minutes of the 326th meeting of the Classification Research Group, held at UCL on Friday 10th November at 2.15p.m.

29 “It was agreed that there was a need to disseminate information about classification, and in particular faceted classification, to people who are now facing the problems of knowledge organization, particularly those developing computerised systems.” Minute 2837 Unconfirmed minutes of the 326th meeting

30 Supra 12

The need for a worldwide communication system that can retrieve information efficiently, regardless of national and cultural boundaries, has become more and more pressing. New electronic environments (such as the Internet, where the world is at hand, where all cultures coexist, and where quality is low) have created this need. These new environments provide significant challenges for those dedicated to the study and research on knowledge representation and organization. Similarly, the digitalization of information is responsible for increasing emphasis on the need for integrating models of knowledge representation and organization. Digitalization allows a huge amount of information to be stored and retrieved, and the challenge is to develop models to improve the management of information in this new framework. Traditional information retrieval systems face similar problems because we lack retrieval tools designed to integrate knowledge. In this situation, an in-depth examination of the integration of knowledge across boundaries is warranted.

Study of the integration of knowledge leads to other important topics. One of these is the concept of universality. New insights into universality needs to include topics geared to the revision of the concept, such as how universality was previously understood in knowledge organization, and what problems arose as a consequence of this understanding. Further, we need to move to a consideration of the concept of universality as it should be understood now, in the electronic era. How can universality be represented in conceptual structures? Integration of specialized knowledge across geographic or cultural domains can be a way to address this unsolved problem. Related to the same problem are topics such as how the integration of knowledge affects different subject domains and users, linguistic issues, and applications that support new models.

In addition, we need to look at equality in knowledge organization. This is an important aspect for supra-national systems, and it means that we need a special focus on minorities so that we can represent them well in knowledge structures. At the same time, professional ethics needs to be reflected within this framework because knowledge organization affects the way people think about and perceive reality, and minorities and other similar groups may become invisible or wrongly conceptualized. Professionals need to be aware of these issues and should be attempting to solve these problems.

In light of these considerations, the integration of knowledge across boundaries is the general theme of the 7th International ISKO Conference to be held in Granada (Spain) in July 2002. The Conference has two main objectives: 1) to analyze models for knowledge representation and organization, as a state of the art departure point, and 2) to propose new models, methods and techniques of integrating knowledge across boundaries in order to improve performance in the new century.

The conference will include the following specific topics, among others:

1. Epistemological foundations of knowledge representation and organization systems and theories
2. Models, methods and concepts for knowledge representation and organization: towards integration and universality
3. Professional ethics in knowledge representation and organization
4. Users in multicultural domain-oriented and/or general systems
5. Evaluation of supranational systems
6. Internet and the integration of knowledge: artificial intelligence, data mining, and multicultural systems

Researchers and practitioners involved in knowledge representation and organization are invited to submit abstract between 500 and 1000 words by September 15, 2001 to Prof. Maria J. López-Huertas. Electronic submissions in Word or RTF format are recommended (please include ISKO in the subject line) to the following address mjlopez@ugr.es

In preparing your abstract please include objectives, methodology and results as far as possible, and relate your topic to the theme of the Conference and indicate the category above to which you believe your paper belongs. An international programme committee will review the papers, and authors will be notified of decisions by November 15, 2001. The deadline for submission of papers for the printed Conference Proceedings will be March 1, 2002. Accommodation and travel information will come later.

**Venue of the Conference:**
Palacio de Congresos de Granada (Spain)
Conference Chair: Maria J. López-Huertas
Mailing address: Facultad de Biblioteconomía y Documentación (Faculty of Library and Information Science) Universidad de Granada. Colegio Máximo de Cartuja. 18071 Granada (Spain)
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Written Knowledge:
A Literary Perspective on Indexing Theory

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ABSTRACT: The general concern of Bazerman’s book Shaping Written Knowledge. The Genre and Activity of the Experimental Article in Science is written knowledge as it is produced by the academy. Bazerman discusses in particular the rhetoric, communicative, and epistemological issues of written knowledge. The article discusses these themes in a library and information science (LIS) perspective in terms of their implications for LIS research.

For several reasons, it is argued that this way of scrutinizing into written knowledge ought to be of special interest to LIS research. As an example of a particular field of research in LIS, the article discusses the relationship between indexing theory and written knowledge. Bazerman analyzes written knowledge from a literary point of view. Among other things, it is argued that indexing theory can be seen as part of literary theory in that some of the questions raised by the latter are also raised in indexing theory. Furthermore, it is put forward that the indexer can be considered an author. The indexer produces a text, the document representation, which is the text the user actually meets in the first place. That way, the producer of a document representation is to some extent responsible for the quality of the documents indexed.

Having discussed this relationship between written knowledge and LIS research in general and indexing theory in particular, it is concluded that LIS research ought to head toward more humanistic oriented research traditions, if the line of research presented by Bazerman should be considered useful for LIS.

Introduction

Bazerman (1988) approaches written knowledge from a rhetorical, communicative, and epistemological point of view. He scrutinizes the relationship between the style and content-oriented means of scholarly literature and its means and modes of productions.

I believe that Bazerman can deliver some insights for library and information science (LIS) research in general, and indexing theory in particular.

Because I use Bazerman’s work—which can be considered a literary analysis of scholarly literature— I imply that this kind of literary analysis could enhance our understanding of indexing. Bazerman’s analysis of written knowledge will, therefore, serve as the premises when discussing indexing theory in the following.

Literary theory and indexing theory are normally worlds apart, despite the fact that they are both concerned with texts and interpretations thereof. The main difference is that indexing theory is not solely concerned with fiction and that it has an ultimately instrumental purpose, namely retrieval.

However, the questions literary theorists raise concerning literature—no matter if these are about the topic or theme, the author’s intention, language use, or the role of the reader—have in fact also been raised...
by theorists of indexing (cf. e.g. Andersen & Christiansen, 1999; Blair, 1990; Fairthorne, 1969; Hjørland, 1992; Hutchins, 1978; Mai, 2000; Wilson, 1968). However, studies into the relationship between literary theory and indexing theory are rare within LIS. Campbell (2000) is in this connection an interesting and worthy example. Campbell discusses literary theory and subject analysis in terms of the aboutness-meaning relationship. While this relationship is recognized in subject analysis theory, Campbell claims that literary theory does not make such a distinction when analyzing works of literature.

This article will be divided into three sections. The first section briefly outlines and comments on the main points of Bazerman's book. The second section will put Bazerman's book into the perspective of LIS, and thereby attempt to show its significance to the LIS research community. The third section will concentrate on the relationship between written knowledge, as it is treated by Bazerman, and indexing theory.

Shaping Written Knowledge

The author, Charles Bazerman, is a professor of Education and English at the University of California, Santa Barbara. His writings cover, among other things, the implications of literacy, genre theory, scientific and technical writing.

The assumption of Bazerman's study is "...that the corpus of scientific writing is one of the more remarkable of human literary accomplishments" (Bazerman, 1988, p. 13). The objective of the book is to dispel the view that scientists never have been and never will be writers (Bazerman, 1988, p. 15). Bazerman claims that, even though scientists' rhetorical choices might be self-conscious or unselfconscious, "In whatever way these writing choices are realized and become institutionalized, they shape the kind of thing we consider contributions to knowledge" (Bazerman, 1988, p. 15). That is, an understanding of the way scientific writing is carried out will provide us with an understanding of what kind of thing scientific knowledge is. Bazerman considers, therefore, written knowledge to be an important point of departure for studying how scientific fields establish knowledge claims through language.

There are four reasons, according to Bazerman, an analysis of scientific writing is an important challenge. First, science, as a social institution in society, has social and cultural influences on us; and we rely heavily on the statements/insight science offers. Therefore, analyzing the statements made in scientific discourse can contribute to a holistic understanding of the influence of scientific writing. Second, even though scientific methods of formulating knowledge may seem abstract to us and not accessible to common sense, our belief in the scientific methods of formulating knowledge remains faithful and largely unquestioned. Third, the successful achievements of science have had and still have great influence on all other domains of intellectual inquiry. Fourth, considerations and treatments of scientific writing have been isolated from other forms of writings.

Communication of scientific knowledge takes place to a considerable extent through scientific literature. Bazerman investigates the human aspect of scientific writing because, he argues, scientific writing influences the very nature of science. Humans use language to gain understanding and exchange meaning. Therefore, one cannot view the production of knowledge in isolation from language. According to Bazerman, however, to ignore language has been the norm rather than the exception. Bazerman (1988, p. 14; emphasis added) notes that:

"Yet to write science is commonly thought not to write at all, just simply to record natural facts. Even widely published scientists, responsible for the production of many texts over many years, often do not see themselves as accomplished writers, nor do they recognize any self-conscious control of their texts. The popular belief of this past century that scientific language is simply a transparent transmitter of natural facts is, of course, wrong..."

Two things need to be said about the emphasized statement. First of all, the belief that language is a transparent transmitter of facts is, after all, only wrong when one does not hold the standpoint that language in fact directly maps onto some state of affairs. One might say that the belief is true when one is convinced by Bazerman’s rhetoric; that language is not a means of direct, unmediated representation. The rhetorical power of communication of knowledge is actually the central theme in Bazerman's book. That is, when Bazerman argues for his standpoint he cannot escape the power of rhetoric himself. Second, when taking a look at the history of philosophy of language one may argue that the belief "that scientific language is simply a transparent transmitter of natural facts" has in fact not been as popular in the past century as Bazerman asserts. The logical positivists believed that only meaningful sentences were sentences
that described some proposition or state of affair; this is also referred to as the ‘principle of verification’. Logical positivists would probably claim that scientific language corresponds to some natural facts out there. However, as a philosophic group, the logical positivists were rather small and had a short lifetime.

A majority of practicing researchers, however, may not be aware of the literary dimension of their knowledge communication. They have at most only an implicit positivistic attitude about knowledge communication. If writing style and rhetoric is implicit and not discussed, it can be interpreted as positivism.

There have, however, been some strongly stated and widely accepted alternative views. Wittgenstein (1958) and Austin (1962) opposed the conception of language argued by the logical positivists. They have had a strong impact on philosophy of language from the middle of this century. They both stressed the pragmatic and social aspects of language. They didn’t conceive language as a means of representation, but as something used to communicate or to do something. Wittgenstein (1958) actually argued against his earlier picture theory of meaning, which he presented in *Tractatus Logico-Philosophicus* (1961).

By paying close attention to the textual form of written knowledge it should become clear what kind of thing knowledge is: i.e. the written form matters (Bazerman, 1988, p. 18). Bazerman examines three articles by investigating how four types of contexts are referred to, invoked, or acted on in the articles. These four contexts are:

1) The object under study
2) The literature of the field
3) The anticipated audience, and
4) The author’s own self (Bazerman, 1988, pp. 24-25).

These four contexts are also named:

1) Language and reality
2) Language and tradition
3) Language and society, and
4) Language and mind (Bazerman, 1988, p. 26).

In examining three scientific articles from molecular biology, sociology and literary criticism respectively -- i.e. articles representing the natural sciences, social sciences and the humanities-- Bazerman shows that the rhetorical strategies used by the authors to gain acceptance of their knowledge claims are very different. Even though close attention is paid to the symbols or words under examination, Bazerman does not intend to restrict his analysis to the symbols alone, because the symbols themselves interact with the world. As Bazerman says in almost Wittgensteinian terms: “Without use and activity there is no language” (Bazerman, 1988, p. 18).

Although Bazerman cautions against making generalizations of the three knowledge domains on the basis of this examination, it nevertheless tells us something about the diverse epistemological nature of these different fields. This stresses that language is of great significance in understanding how the knowledge that scientists communicate is given legitimacy. Not all scientists are aware of or will acknowledge that they, in fact, are authors and narrators reporting their research findings through language. Nevertheless, this does not change the fact that language influences the formation of what we conceive as knowledge in society, which in turn, does not mean that sciences cannot be objective. It merely means that what is conceived as objective can be formulated in various ways and with various rhetorical methods. Writing science is basically, according to Bazerman, solving rhetorical problems.

Bazerman furthermore shows that the experimental article, which was developed in the 17th-century, is a genre, which supports the empiricist view of knowledge. The experimental article reports an experimental situation, and the argumentative function of the article lies in the description of the experiment. Isaac Newton (1642-1727) is presented as influential in setting the norms for scientific argumentation and publication. What Bazerman here attempts to emphasize is that form influences content. This epistemological point made about form and content is further put into perspective when Bazerman shows that 20th-century social science articles have adopted and adapted the form of the experimental article in order to communicate their knowledge.

The impact of empiricism has also been stressed in recent years in LIS by, among others, Budd (1995), Cornelius (1996), Hjørland (1997), and, lately, Dick (1999).

Bazerman analyzes how scientific communication has developed historically. This analysis of scientific communication stresses that communication is at the heart of science as a social system: From announcement of scientific discoveries in the first scientific journal in 1665, *Philosophical Transactions of the Royal Society of London*, to today’s peer review system.

According to Bazerman, various disciplines shed light on the problem of writing knowledge and on what the activity of texts is. Sociology of science con-
tributes with an understanding of how communication is organized in various academic communities, "and how texts fit in with the larger systems of disciplinary activity" (Bazerman, 1998, p. 4). Philosophy of science contributes with an understanding of how disciplinary activity is conceived of by people, because what people think they are doing can provide insights into how they use language to accomplish those things. History provides an understanding of how any scientific writing activity is conditioned by history, because to write is to be part of a history. Psychology provides an important insight into the problem of writing knowledge, because "As a historically realized, social, epistemological activity, writing is carried on through people. People write. People read" (Bazerman, 1988, p. 5). What a text is must therefore take into consideration how people create it and use it. By putting writing into these perspectives, Bazerman touches upon language theory. He does not think that the single (written) word can be considered in isolation from its use, because "If the written word could only be understood within a historical, social moment, that would vex many of our habits of looking at language and texts as fixed structured systems of meanings" (Bazerman, 1988, p. 5).

In general, Bazerman's book demonstrates how the origins of modern science influence scientific activity. The goal for science is text production, which cannot be understood without taking the role of language into consideration. It seems reasonable, therefore, as Bazerman does, to consider scientists as writers of knowledge. By stressing this point about science and scientists, Bazerman shows that scientists are faced with the same linguistic and rhetorical problems as other professions whose job is some kind of text production. In short, analyzing written knowledge produced by the academy matters.

**Shaping Written Knowledge and Library and Information Science**

Bazerman’s analysis of written knowledge seems to present fruitful research potentialities to the library and information science (LIS) research community. Research into subject literature (or non-fiction as Bazerman chooses to name it) and its types, concepts and theories is a field of study that lacks attention in LIS. Bibliometrics is, of course, a field of study that has subject literature as an object. But due to the quantitative nature of bibliometrics, it cannot tell us something about the epistemological implications of the knowledge claims put forward in texts, or how texts are composed. Therefore, studies into composition of texts can be a very fruitful supplement to bibliometrics (cf. Hjørland, 1998a, p. 23).

Thus, LIS should acknowledge studying subject literature, because it is, primarily, subject literature that is the object for theories of knowledge organization, bibliometrics, and information seeking and use. Studying how scientific documents are composed, the different types of documents, and how language is an instrument in the process of creating scientific knowledge has implications for research into knowledge organization, full text retrieval, information seeking and use, and scientific communication in LIS. The reason for this is that subject literature, as Bazerman (1988, p. 60) points out, can be said to be the representations of worlds in words, and because "...nonfiction creation incorporates procedures tying texts to various realities." (Bazerman, 1988, p. 60).

Buckland (1999) makes a distinction between two traditions within LIS: ‘A document tradition’ and ‘A computational tradition’. As the name might indicate the ‘document tradition’ is concerned with documents, with signifying records (Buckland, 1999, p. 970). The ‘computational tradition’ is concerned with finding uses for formal techniques such as mechanical or mathematical (Buckland, 1999, p. 970). Due to this distinction, Buckland links the concept of document to the ‘document tradition’. About the ‘document tradition’ Buckland (1999, p. 971; my italics) writes that it “...has to do with knowledge, meaning, learning, description, and language and ambiguity, therefore, any view of it remains incomplete unless some roots in cultural studies, in the humanities and qualitative social sciences, is acknowledged.” Several authors have in a similar way stressed the importance of the concept of document in LIS research (cf. Hjørland, 2000; 1998a; 1998b; Hjerppe, 1994 & Houser, 1986a), and LIS needs to acknowledge these roots in cultural studies, the humanities and qualitative social sciences when studying subject literature. Studies of literature (fiction) take place in a humanistic-historical context. The same applies to studies of subject literature. Because it places the study of subject literature in a humanistic-historical context, Bazerman’s book and the kind of research it presents can suggest the importance of studying the concept of the document in LIS.

Bazerman himself states that “Important stories remain to be told about theoretical articles, reviews of literature, speculative articles, handbooks and other reference works, proposals, and various pedagogic genres – their separate histories and interrelation-
ships." (Bazerman, 1988, p. 7), and further that “Literary studies of non-fiction rarely ventured beyond bellettristic biographies and autobiographies.” (Bazerman, 1988, p. 11). Authors in LIS ought to contribute to these important stories. For instance, seen from the point of view of information seeking, what does LIS actually know about handbooks as information seeking tools? And more important, if LIS has some knowledge of this, are others outside the LIS community aware of this knowledge?

However, LIS researchers have made some contributions. Concerning reviews of literature Lindholm-Romantschuk (1998) has made an interesting contribution. She analyzed quantitatively the information flow in the social sciences and humanities in terms of book reviews. What Lindholm-Romantschuk found out was, among other things, that the humanities tend to review many books from the social sciences.

In terms of review articles Woodward (1977) has analyzed the roles of these in information transfer, and distinguished between historical and contemporary functions of review articles. But research into primary literature (e.g. theoretical articles) and its implications for and relation to, for instance, knowledge organization is hard to find in LIS. One example, though, is Houser (1986b).

Another example from LIS, advocating the line of research presented by Bazerman, is Hjørland (1998a; 1998b). Research into subject literature is related to the study of documents. In this connection, Hjørland (1998b, p. 616) claims that LIS has not produced a theory of documents. According to Hjørland a theory of documents must be connected to an analysis of functional differentiation of primary, secondary and tertiary documents (Hjørland, 1998b, p. 616-617). Thus, Hjørland’s work connects to Bazerman’s work, providing a way of studying documents in epistemological terms.

One could claim that information retrieval (IR) research, as described by Ellis (1996), has contributed to moving attention away from the concept of document and its significance to LIS, and thereby making LIS and, in particular, mainstream information retrieval (IR) extremely sterile and naïve. In this connection it is strange to notice that Buckland (1999, p. 971) connects IR with the above mentioned ‘document tradition’. But when developing IR-techniques such as search algorithms is it the same algorithm to be applied whatever type of document (e.g. primary or tertiary documents) it is applied to? How can algorithms for IR be constructed if no consideration is
given to the style and conventions of, for instance, scientific writing, and the conditions under which it is produced? Algorithmic IR techniques do not seem to take into account that

“An article in a journal can be written from one epistemology in a journal following principles inspired by a second epistemology. The same article can be indexed in a database influenced by a third epistemology, and used by a user interested in e.g. anorexia from a fourth epistemological point of view” (Hjørland, 1998a, p. 28)

Algorithmic IR techniques do not seem to consider documents as instruments or tools in communication; i.e. they do not conceive of documents as developed and produced in a social, historical, and cultural context, determining the materiality they cannot do without (cf. Duguid, 1996). Rather, algorithmic IR techniques seem to consider documents as ahistorical entities that can be exposed to algorithmic treatment distilling ‘pure’ information.

However, from the point of view of IR research, Ingwersen (1996, p. 30-34) seems to be aware of writing style and conventions, when talking about paragraphs or sections as possible access points to full text documents. But Ingwersen does not analyze this further in terms of epistemological and interpretative issues of texts and their role in communication, as is done in the work of Bazerman and others (cf. Bazerman & Paradis, 1991). In this connection Hjørland (1998a) is arguing for the relevance and importance of text composition, epistemology, and semantics when discussing subject access points in IR, and connects Bazerman’s work into this framework. But in general, mainstream IR research does not seem to be aware of or acknowledge such kinds of problems, which are problems of how documents are composed, and of how documents structure their knowledge claims. Mainstream IR research is simply not that much concerned with epistemological and interpretative issues of text structures. Bazerman can be useful to LIS, because he delivers a foundation as to how to understand the composition of documents.

Written Knowledge and Indexing Theory

Indexing theory is here considered as being concerned with providing a coherent foundation as to speak of and understand the assignment of words and concepts, when organizing and representing texts (i.e. written knowledge) in information systems. That is, a
theoretical perspective from where LIS can speak of organization and representation of texts.

When discussing this, the epistemological issues of written knowledge, as recognized by Bazerman, cannot be excluded here. Hence, the epistemological issues must logically serve as the presuppositions for a discussion of the organization and representation of texts.

The way Bazerman analyzes subject literature is done by the use of the aforementioned four contexts: 1) the object under study (language and reality), 2) the literature of the field (language and tradition), 3) the audience/readers (language and society), and 4) the author’s self (language and mind). This analysis is carried out in order to show how these contexts are referred to, invoked, or acted on. How a text refers to, invokes, or acts on, each of these contexts is explored through the specific features of language (Bazerman, 1988, p. 25).

The analysis Bazerman is applying to subject literature is basically some sort of literary analysis. It is therefore open to discussion whether such kind of analysis applies to subject literature at all. But what does an argument against applying such kind of analysis on subject literature produced by the sciences look like? An argument could be that there is a fundamental theoretical distinction between fiction and subject literature. However, while this might be true, it is still not an argument in favor of not applying literary methods, when analyzing literature produced by the sciences. Who can write a text (fiction or non-fiction) without using rhetorical and stylistic strategies? And as Bazerman (1988, p. 26; emphasis added) states, when being a narrator of scientific texts:

“An author, in deciding which words to commit to paper, must weigh these four contexts and establish a workable balance among them. 

A text is, in a sense, a solution to the problem of how to make a statement that attends through the symbols of language to all essential contexts appropriately.”

Accepting this statement by Bazerman, ought to justify the application of literary methods when analyzing subject literature.

By analyzing texts in relation to these four contexts, Bazerman believes that it will tell us something about what kind of thing knowledge is. In doing this Bazerman recognizes the epistemological implications of such an analysis (Bazerman, 1988, p. 26), because to say something about what kind of thing knowledge is, is in itself an epistemological issue.

If one substitutes ‘knowledge’ with ‘a subject’ in the sentence, then the sentence goes like this: “By analyzing texts in relation to these four contexts, it will tell us something about what a subject is”. Thus, the point to be established is that the concept of subject is connected to the concept of knowledge. That is, indexing theory implies epistemological issues. This has also been recognized and stressed by Hjørland (1992), when he argues that the concept of subject should have a central role in indexing theory, and, in continuation of this, defines a subject as the epistemological potentialities of documents. Hjørland’s definition of the concept of subject is not supposed to be confused with Wilson’s (1968, 1968, p. 67) utility of a writing: “...for the utility of a writing, if any, is by no means bound to lie in its contribution to the understanding of its subject.”

The implication of Hjørland’s concept of subject to indexing theory is that to determine the subject of a document is tantamount to assertion of an epistemological statement about that particular document. To assert an epistemological statement about a particular document is, among other things, to say something about what kind of knowledge that document expresses through the subject(s) treated.

In the following, the four contexts presented by Bazerman will be discussed in relation to indexing theory. If one accepts Bazerman’s way of analyzing subject literature, then it seems reasonable to assert that indexing theory is a kind of literary theory. If Bazerman’s way of analyzing subject literature should be of any interest at all to LIS, it must be in relation to indexing theory. As stressed by Andersen & Christensen (1999), an indexing theory is also a theory of documents (texts), and it must account for the circumstances that constitute documents. The four contexts presented by Bazerman can, to some extent, be said to account for these circumstances, because Bazerman’s examination “…will not be of dormant symbols lying quietly on flat pages. The symbols will constantly lead us outward to the many worlds they interact with.” (Bazerman, 1988, p. 18; emphasis added).

Before proceeding with the discussion of Bazerman’s four contexts in relation to indexing theory, it should be noted that LIS is in fact not unaware of such discussion. From a different angle, Wilson (1968, pp. 69-92) has discussed four methods of analysis to come up with the subject(s) of a document1. Wilson names his four methods as the purposive way, the fig-

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1 Wilson does not use ‘document’ but ‘writing’
ture-ground way, the objective way, and the appeal to unity (or rules of selection and rejection). The pur-
posive way is concerned with the author’s aim or purpose with the document. Hence, the purposive
way has similarities with classical hermeneutics. The figure-ground way is concerned with what stands out
or what is most emphasized in the document. The objective way of determining the subject of a document
is concerned with counting references to items in the document. The idea of the objective way could be in-
terpreted as the one behind automatic indexing. However, the fallacy of automatic indexing is that it
confuses syntax with semantics. The appeal to unity (or rules of selection and rejection) is concerned with
what makes the document coherent, unified and complete, and what is selected and rejected in order to
make the document coherent, unified and complete.

As with Bazerman’s four contexts, Wilson demonstrates that these four methods are each looking for
something different, and, hence, will tell something different as to what the subject is. But in contrast to
Bazerman’s four contexts, which are applied at once on the same text in order to say something about
what kind of thing knowledge is, Wilson doesn’t seem to advocate his four methods to be applied simultane-
ously on the same document. Nonetheless, Wilson’s appeal to unity can be interpreted to be the one
method, which to a certain extent is equivalent to all Bazerman’s four contexts.

Another example of approaching indexing by stressing the same things similar to Bazerman’s ap-
proach is Swift, Winn & Bramer (1977). In their cri-
tique of the concept of aboutness, they put forward
their ‘multi-modal approach’. Swift, Winn & Bramer
do not believe that established methods of indexing
are appropriate for social scientists. Instead of ‘carving
things up’, these authors suggest that documents
ought to be analyzed in terms of theoretical orienta-
tion, method of research, empirical situation under
study, data collected and form (Swift, Winn & Bramer, p. 91, 1977). The elements mentioned are
elements that are characteristic of and obligatory in
primary literature. Thus, by stressing these aspects
and their importance in document representation,
Swift, Winn & Bramer’s (1977) ‘multi-modal ap-
proach’ actually recognizes the importance of research
into primary literature. To a certain extent these ele-
ments are what Bazerman analyzes in terms of how
they are referred to, invoked, or acted on.

Further, when defining a subject as being the episte-
mosological potentials of a document, Hjørland’s
(1992) concept of subject comes very close to the
‘multi-modal approach’. A document’s epistemologi-
cal potentials are, among other things, what theoreti-
cal orientations the document relies on, methods used
e.

The Four Contexts

Intuitively, the first context, the object under study,
could be considered essential in determining the sub-
ject of a document. It is rather tempting to claim that
the object under study must be the subject (cf. ISO,
1986). But what leads to this seemingly logical conclu-
sion? The object under study does not in itself suggest
such a conclusion. The object under study might just
be there in some way or another, but that doesn’t
automatically turn it into the subject of a document.
A given document (e.g. primary literature) probably
has an object under study, but various subjects and
concepts can contribute to illuminate or mention the
object under study, and the way the object under
study is present in a document might vary according
to what knowledge domain the document is repre-
senting. But it still doesn’t establish the object under
study as the subject of a document per se. The object
under study may as well arise as the document moves
on. This implies that the object under study can be
conceived of as rather insignificant, when it comes to
determine the subject of the document.

According to Bazerman, the way the object under
study is referred to, invoked, or acted on, is not just a
matter of how it is plainly described in words on the
single page(s), but also of how the object under study
is linguistically constructed in the particular docu-
ment. An examination of the lexicon of the document
reveals this. That is, what kind of information is con-
voyed in order to talk and write about the object un-
der study, and thereby to “indicate the quality of tie
between text and the world” (Bazerman, 1988, p. 25).
This information might contribute to determine the
subject of a document, because it depends on how the
object under study is linguistically treated in the par-
cular document. This may lead to determine
whether the object under study is the subject of the
document.

When analyzing a text in relation to the literature
of the field, Bazerman thinks of how the literature is
being used in the document. That is, are explicit cita-
tions or implicit citations being used, or is the litera-
ture used in a defensive or offensive way. If the way
the literature of a subject field is referred to, invoked,
acted on in a document can contribute to determine
what the subject of the document is, then one is to some extent moving outside the actual document. In this way, Andersen & Christensen (1999) have argued that indexing is a representation of meaning. This meaning is the result of what constitutes the document: *Its production, distribution, and consumption*. In other words, processes that lie outside the particular document. To some extent, then, the way the literature of a field is referred to, invoked, or acted on in the document can give indications of what the subject of the document is, because the literature of a field indicates the document's relationship to the previous literature on the subject, or how the document is in dialogue with the previous literature in the field. The previous literature on the subject might be said to represent a relatively stable body of knowledge, and therefore in some way constitutes the actual document.

The way the *anticipated audience* is referred to, invoked, or acted on in a document is thought of in the sense of what knowledge and attitudes the document assumes the readers will have, how the anticipated audience is addressed, how a given argument or knowledge claim is structured in the document (cf. Bazerman, 1988, p. 25). However, this context is not supposed to be confused with a subjectivist view of knowledge and subjects. It is not a question of how the audience conceives of and interprets the document, but rather of how the author of the document constructs and places his various knowledge claims in the document in order to attempt to persuade the audience of the validity of his knowledge claim; i.e. a kind of social negotiation between author and audience. In doing this, the author assumes something of his readers and their response to the document and the knowledge it delivers or argues for. However, if the author of a document assumes or expects something about his readers, then it follows that the author himself is not free to put on a page what he likes. This can be explained by the fact that documents are instruments in scientific communication, and as such they are linguistic devices in the communication of knowledge. The author must use a language common to the audience. The author of a document must recognize this, when having a desire to communicate knowledge to his audience. This common language can consist of the technical terminology applied in a particular field of study.

Seen from the point of view of indexing theory, how can this context contribute to determining the subject of a document? If the author assumes something about the knowledge the readers will have, then it is not unthinkable that the subject of a document can be rather implicit. For instance, if a literary critic comes up with a new interpretation of a given poem, the critic has to convince the audience of this new interpretation. The audience is assumed to know and be acquainted with the previous readings of the poem in question. The task is to show what's new in the interpretation delivered. The interpretation is only new if the audience can recognize it as such, and if the previous readings of the poem do not suggest such an interpretation. The new interpretation must be the subject of the document, not the previous readings of the poem. However, it is the previous readings that are under discussion in the document. The previous readings can be said to be the object under study, because it is the previous readings that the new interpretation reacts on. The subject of the document is the new interpretation given. Thus, the subject of the document is negotiated between author and audience and, therefore, is not something that the author created himself in advance.

The *author's self* is present in various ways in the document. First of all, the author is the mediation link between the knowledge to be argued for and the audience to perceive this knowledge. This mediation of knowledge is of course done by the use of language. It is at this point the author of a document becomes a narrator. The author has to tell a story that sounds reasonable to the anticipated audience. In fields of study where the degree of consensus as to what counts as knowledge is relatively stable, the author will probably be rather 'invisible' or objectified in the document. That is, the story exposes itself without the author sitting behind the wheel. In less paradigm-laden fields of study, the author of a document will probably be more visible, more subjective, and active in the document as to tell the story. Seen from the point of view of this context, the subject of a document is dependent on where the author is in the document. That is, the story exposes itself without the author sitting behind the wheel. In less paradigm-laden fields of study, the author of a document will probably be more visible, more subjective, and active in the document as to tell the story. Seen from the point of view of this context, the subject of a document is dependent on where the author is in the document, because the author is a public face "...which makes the reader aware of the author as an individual statement-maker coming to terms with reality from a distinctive perspective.” (Bazerman, 1988, p. 26). From the point of view of this context, it is these individual statements made by the author that are of interest in determining the subject of the document, because it can be argued that indexing, at some point, is an interpretation and a representation of these statements. This is not to say, however, that it is the author who determines the subject of the
document. On the other hand, it is the author who has the power to decide which words to put on a page. It is also these individual statements that reveal the value assumptions made by the author. These value assumptions can themselves contribute to determining the subject of the document, because they might give clues as to what the document is or is not about. In the determination of the subject of the document then, one cannot escape paying attention to the value assumptions.

The above discussion of Bazerman’s four contexts in relation to indexing theory has shown that, as also argued by Mai (2000), to try to say something about the subject of a document is not a matter of checking out titles, abstract, headlines, or counting words and the like. The way a document refers to, invokes, or acts on the object under study, the literature of the field, the audience or readers, and the author’s self reveals that these four contexts are in interaction with each other, and shows that they are components that make the document coherent as a linguistic device in scholarly communication. The text in itself contains a lot of ‘life’ and is a product of a variety of circumstances (i.e. the four contexts) that contribute to a complex understanding of what the subject is.

To the extent Bazerman is right in claiming that these contexts and their presence in a document tell something about what kind of thing knowledge is, the concept of subject is a theoretical issue implying epistemological issues as well. An author of a piece of subject literature must take into account these contexts when producing his statements of knowledge. Here is the connection between the concept of subject and the concept of knowledge with regard to indexing. An indexer must also take into account these contexts when producing a representation of a text with descriptors. That way an indexer can be considered an author, because the indexer produces a statement of knowledge when representing a document and thereby reproduces a document, namely a document representation (see figure 1). This way of conceiving the indexer and her connection with the document has strong similarities with a documentation science conception of the production and reproduction of documents. The reproduction process is here indexing, classification, and use of documents. According to Mangen (1999, p. 57), a documentation science analysis of documents looks at every step in a production-reproduction process and sees the document as the result of a process involving many agents and producers (Mangen, 1999, p. 58). Such an analysis recognizes the importance of paying attention to the processes constituting the actual document in order to understand that document. This is also illustrated in figure.

seen from an indexing and information seeking point of view, the reader (or user), as conceptualized in the LIS-vocabulary, does not meet the actual document, but a representation and reproduction of it that is an interpretation of the document. Thus, when the indexer produces a new text, Wilson explains in his discussion of how to determine the subject(s) of a document, why "...nothing definite can be expected of things found at any given position." (Wilson’s emphasis, 1968, p. 92).

Also, by introducing the production, distribution, and consumption stages in the model, a link between indexing theory and Egan & Shera’s (1952) social epistemology is established. They defined social epistemology as "...the analysis of the production, distribution and utilization of intellectual products." (Egan & Shera, 1952, pp. 133-134). Egan & Shera launched social epistemology, when arguing for a theory of bibliography, and through this emphasis was put on the epistemological issues of communicating knowledge through documents. There’s need for a social epistemology, according to Egan & Shera, because ‘traditional’ epistemology is mainly concerned with ‘...the
thought of as a thing. Illocutionary acts are thought of in the sense that to say something is to do something, that is, we are able to perform something with language rather than just describing something with language. By communicating we can do something. This is exactly what authors (and indexers) do. Austin distinguished between three types of performatives: locutionary acts, illocutionary acts and perlocutionary acts. Locutionary acts are thought of in the sense that to say something is to do something; the illocutionary acts are thought of as in saying something we do something and, finally, by perlocutionary acts are meant by saying something we do something. Through indexing one can actually make something happen. One can advise some kind of usability or visibility of the documents indexed, or express its intensional or extensional aboutness (Fairthorne, 1969).

Considering language as something with which we can do or obtain something implies for a theory of indexing that it is also a theory of “how to do things with words”. This aspect of language, recognized by Austin (1962), pays particular attention to the social activities of language that are vital for a theory of indexing to recognize. Indexing practice is itself a social activity, and an indexing theory should be the framework from which the actual indexing practice is supposed to be understood. In this way indexing can be interpreted as at one and the same time being a locutionary, illocutionary and perlocutionary act.

There is no reason, then, not to consider indexing theory as some kind of literary theory, to the extent that the latter is concerned with texts and interpretations thereof. However, while literary theory is concerned with the actual literary text as an object, indexing theory must be concerned with the universe of texts. This universe of texts is, following Wilson (1968), that with which bibliographical control is concerned. Indexing theory, then, is also connected to the enterprise of bibliographical control.

Conclusion

Many discussions within LIS have centered around what kind of thing LIS is and what it should be. However, one thing should be clear. As has been stressed in section two of this article, the concept of document ought to have a central position in LIS research. This conclusion may sound rather trivial, but the point is that documents have been developed in a historical context that has shaped the form and content of documents. This cannot solely be studied by quantitative research methods, as IR research usually makes use of, and this is where a humanistic research tradition enters the stage. The humanistic research tradition is basically founded in hermeneutics. If the LIS research community is to recognize the overall research potentialities presented by Bazerman’s book as demonstrated in section three of the article, it is clear that LIS needs to reorient itself towards a more humanistic research tradition.

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References


Content Organization in the New Millennium

(Papers contributed to the Seminar on Content Organization in the New Millennium, Bangalore, 2-4 June 2000)

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Content Organization in the New Millennium is a compilation of papers contributed to the Seminar on ‘Content Organization in the New Millennium’ (2-4 June 2000). There were nine invited presentations on various aspects of content organization.

The rapid developments in and widening range of use of the Internet worldwide is enabling easy access to information and data globally and almost seamlessly. The quantity, range and variety of information – as text, image, graphics, sound, and multimedia – that is accessible is indeed vast. On the other hand, the ease with which almost any data or information can be placed on and disseminated via the Internet is causing problems for information seekers. One of the causes of these problems is the amorphous nature of the information accessed which has only minimal organization. This results in, among other things, retrieving too much information that is irrelevant to the subject of interest to the user, and, many a time, it is like searching for a needle in a haystack. Recently, information professionals and subject specialists have become concerned with the situation and have experimented with tools, techniques and strategies, and with the use of time-tested classificatory ideas and other knowledge organization tools, such as thesauri, to mitigate the problems.

The paper on “Knowledge Management and Content Organization” by L.J. Haravu places the subject of content organization in the broader canvas of knowledge management (KM). Content organization and the tools necessary to aid knowledge discovery, a basic objective of most information seeking activity, is discussed in the paper “Content Organization as an Aid to Knowledge Discovery” by A. Neelameghan. In that paper, the role of statistical, informetric and scientometric techniques are mentioned, but elaborated on by I.K. Ravichandra Rao in his paper “Quantitative Techniques for Content Analysis.”

HTML forms for web publishing and embedding metadata have been in wide use; but they are being extended or replaced by XML, XSL, etc. for customizing “Data Type Definitions” to enhance retrieval effectiveness. Shalini R. Urs and K.S. Raghavan discuss this aspect of content organization based on the experience of building a database of theses.

The variety of factors to be taken into consideration in content organization for Internet-based information services is elaborated by T.B. Rajashekar on the basis of practical experiences at the Indian Institute of Science. S.B. Viswakumar identifies factors that may affect content organization in multimedia databases.

Handling the scripts and vocabulary of Indian languages in organizing the contents of databases raises additional problems and issues, and these are being examined in an increasing measure as more and more such databases are being constructed in this country. B.A. Sharada considers some aspects of the problems of preparing databases in Kannada language.

The papers by M.A. Gopinath and G. Bhattacharyya deal, respectively, with the training required for and professional aspects of, content organization.

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Taxonomy of Novel Abstracts
Based on Empirical Findings
Jarmo Saarti
Kuopio University Library, Finland


ABSTRACT: This paper examines the content description of fictional works, specifically novels. The data for the empirical part of the study was gathered in Finnish public libraries. The aim of the study is to find out how library clients and library professionals of public libraries describe novels by abstracting them – what are differences in their characterisations and what are the similarities between their abstracts. Also, a taxonomy of novel abstracts is given. The abstracts are classified into four categories in the taxonomy: plot or thematic abstracts, cultural-historical abstracts, subjective or personal abstracts and critical abstracts. In the final portion of the paper, a model for a search and retrieval system for fiction is presented.

Introduction

Fiction retrieval is a special issue that has recently aroused much interest in information science. This interest is due to several factors, the most important being the need for fiction retrieval and developments in computer systems that have made it possible to create retrieval systems for fiction. Retrieval is now possible through the use of a multifaceted approach for analysing and describing fictional texts. On the other hand, it has been noted that when libraries computerise their collection, a large amount of material remains unindexed from the years of paper catalogues – and most of that unindexed material has been and still is fictional texts.

Furthermore, the gradual shift to the digital distribution of materials requires new tools for analysing the content of fictional materials as well as for indexing. Indeed, it is difficult to retrieve texts and other materials that have not been analysed and classified and/or indexed in full text databases. Thus, the distribution of this kind of material becomes very difficult, if not totally impossible. One further aspect, which emphasises the need for content analysis of fictional materials, is that free text searches cannot be used efficiently when searching for fictional material. This problem becomes apparent if we compare, for example, a search for fiction with the search and retrieval of natural science material, where texts are usually very topical and unambiguous.

There are very few empirical studies into the content representation of fiction. This paper is based on a test situation, where the aim was to determine what kind of abstracts the library clients and library professionals wrote for novels. Abstracting is a good, and perhaps an even better way than indexing, of describing the contents of a novel. By abstracting, one can describe also complex thematic and chronological entities (cf. Pejtersen’s idea of concrete indexing strings (1996, 25) and the idea of synopsis).

This paper summarises the parts of Jarmo Saarti’s dissertation (1999b) that deal with content description of fiction done by abstracts. In this paper, the empha-

1 A grant by Ella and Georg Ehrnrooth’s foundation has made this paper possible. I am indebted to Dr. Ewen Macdonald for his help with my English.

2 There are already quite sophisticated fiction retrieval systems in use in the on-line bookstores.
sis is on the taxonomic aspects of content description, as well as on the information systems of fiction and how these taxonomies are based on the information process of fiction. The other part of the dissertation work concerns the consistency of the fiction content description, predominantly the indexing of fiction (see Saarti 1999b, 2000).

**Information Process of Fiction**

The primary participants in the information process of fiction are: the work of art, its creator (i.e. the writer), the reader, and the social-historical environment where the publishing and reception takes place (see fig. 1.). Due to the nature of fictional works, the reception of the work of art is not fulfilled unless all of the participants mentioned above are involved in the process. The role of the writer is to write works of art – novels, short stories, poems, plays etc. – which are to be published. The role of the work of art is to be the medium through which the artist can communicate with his/her audience. Furthermore, the work of art has its own, autonomous life: after the book is published, the writer can only have a role as one of the readers, for example, as an interpreter of the work.

The role of the reader is that of the interpreter of a work of art. The interpretation, as well as the creation of a work of art, takes place within a social-historical context that defines the language used and a work’s
means of artistic expression. Without this common language, no communication between readers and writers could occur.

Fictional communication is typically twofold. It consists of factual meanings, such as references to actual happenings, historical and geographical facts (see e.g. Ranta 1991, 20-23). On the other hand, it has an aesthetic function and is thus based on the individual interpretation and reception of the work of art. This duality impacts the content description of fiction: on the one hand objective grounds can be identified, but on the other hand, some aspects are more likely to be subjective and thus personal, diverse and varied.

Research Questions, Data and Methods

The basic theoretical approach used in this study was qualitative: specifically, a grounded theory approach was used (see, e.g. Strauss & Corbin 1990). Since the aim of this study was to construct a taxonomy of the aspects used in the content description of fiction, both qualitative (mainly content analysis) and quantitative methods (mainly statistics) were used in the analysis of the empirical material gathered. This triangulative approach was chosen to confirm the findings of the study (see e.g. Strauss & Corbin 1990, 18-19, Breitmayer & Ayres & Knafl 1993).

Five novels from different genre categories were chosen for the experiment, which made it possible to analyse the differences between the content descriptions of different genre types, as well as the differences between serious (high-brow) and recreational literature. These were (their genres in parentheses):

- Dostoyevsky, F. M.: Notes from the Underground (serious, foreign).
- Kauranen, Anja: Kultasuu (Golden Lips) (serious, domestic).
- Mustonen, Enni: Nostovara (romance, the title is a pun and impossible to translate, domestic).
- Paasilinna, Arto: The Year of the Hare (humour, domestic).
- Simenon, Georges: Maigret at the Gai-Moulin (detective novel, foreign).

Altogether, 30 people were chosen as abstractors for the novels mentioned above. Abstractors were selected from five different Finnish public libraries: three patrons as well as three librarians or other library staff members from each library. Library staff had previous knowledge or working experience of the indexing of fiction. The patrons chosen were avid readers of fiction. The aim here was to determine how the role of the library professional affected the content descriptions and how literate individuals describe novels.

In order to ensure the comparison between different test subjects, they were all required to read the same novels. They read all the above books within two months (the books were all about 200 pages long). They were then invited, as a group, for a discussion and asked to complete the questionnaire. During the group session, they all abstracted3 the above novels. The writer of this study was with them in situ. The whole process of abstracting lasted about two hours in each library.

First, the abstracts were analysed statistically, and the basic statistics were calculated for the abstracts. After that, a content analysis of the abstracts was completed with the aid of an observation matrix (see Miles & Huberman 1994, 207-224). The aspects on which the content analysis was based were derived from the model of fictional communication (see previous section) and from previous studies on the content description of fiction (see e.g. Pejtersen & Austin 1983 and 1984, Beghtol 1994 and Saarti 1999a, 1999b).

The abstracts were divided into the following categories for the primary content analysis:

- Descriptions of the novel’s content elements (thematic elements, elements of the plot, personae, settings, time etc.).
- Descriptions of the novel’s structure.
- Descriptions of the reading experience.
- Descriptions of the novel’s place in the history of the fiction.
- Descriptions of the author.
- Descriptions of how the work was evaluated.

In order to generate analytical categories, the primary categories above were divided, according to the main participants in the communication process of fiction, into four categories (see fig 2). These include all the analytical elements in each category (see also Table 1.).

The categories were specified as follows. Descriptions of the novel’s content elements included all the notes made by abstractors that referred directly to the content of the novel. These included the main aspects defined in previous studies, such as setting, time, personae, actions and thematic elements. Descriptions in this category can be seen as direct references to the

---

3 The same novels were also indexed after abstracting them by all the participants, see: Saarti 1999b, 2000.
Descriptions of the novel's content elements and structure:  
- thematic elements,  
- elements of the plot,  
- personae,  
- settings,  
- time,  
- structure of the work.

Descriptions of the author:  
- personal history,  
- history of publications.

Descriptions of the reading experience:  
- interpretation,  
- evaluation of the work.

Descriptions of the cultural-historical continuum:  
- cultural-historical elements that have influenced the work,  
- intertextual connotations,  
- status of the work in the hierarchy of fiction.

Fig. 2. The aspects used in content analysis.

<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptions of the novel's content elements</td>
<td>Aspects describing the contents of a novel: thematic elements, elements of the plot, personae, settings, time etc.</td>
<td>&quot;Anja Korpela works in a little branch office of a bank, living in the same building with her two kids.&quot;</td>
</tr>
<tr>
<td>(The book describes) &quot;...loneliness and anguish of a man.&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Detailed narration and description of circumstances...&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Descriptions of the reading experience</td>
<td>Aspects describing the personal reading experience of a reader.</td>
<td>&quot;...boring reading for me.&quot;</td>
</tr>
<tr>
<td>&quot;...very catchy, although it didn't have any special effect on me.&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Descriptions of the novel's place in the history of the fiction</td>
<td>Aspects describing the status of a novel in the history of literature.</td>
<td>&quot;(It reminded me of) Hercule Poirot's and Miss Marple's 'adventures'.&quot;</td>
</tr>
<tr>
<td>&quot;...similar to the Kerouac's work On the Road...&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Descriptions of the author</td>
<td>Aspects describing the author and his/her other works.</td>
<td>&quot;...typical of the Anja Kauranen of the 80's.&quot;</td>
</tr>
<tr>
<td>&quot;I mix up in my mind the book and the movie and possibly all the other Paasilinna books.&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Descriptions of the evaluation of the work</td>
<td>Aspects describing the objective evaluation of a novel.</td>
<td>&quot;Nearly worthy of five stars and it was best of these five books I had to read.&quot;</td>
</tr>
<tr>
<td>&quot;Novel is a typical example of a classic that will last through the years.&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1. The categories, their descriptions and examples used in the analysis

plot and contents of the novel without deeper personal interpretation.

Descriptions of the novel's structure included direct references to the structural aspects of the narration. Descriptions of the reading experience included references to one's own personal experience of the reading process. During the actual content analysis, these two were the most difficult aspects. Indeed, the former caused difficulty because one can see the chronological listing of the content elements of a novel as a description of its structure. This type of description was evident here also; the majority of abstracts of this type listed these elements in the same order as they occurred in the novel. In this study, this problem was resolved by including only direct verbal references to the structure4.

4 In the actual indexing of fictional works this can be solved with the aid of logical, meaningful indexing strings or, as Pejtersen (1996) has presented, with the aid of concrete indexing strings.
The latter, reading experience, was difficult in this analysis because it was sometimes difficult to discern the difference between reading experience and evaluation of the book. This was solved by including only those elements that could be considered objective – those elements based on objective facts such as the hierarchy of literature – in the evaluation of the book category. In these abstracts, this kind of evaluation was done by comparing the novel with other works, especially with classics. The reading experience category included those comments that the test subject named as his/her own, such as interpreting and analysing one’s own life and tastes against the book.

Some examples of the previously mentioned categories are listed in table 1. The most typical fragments are chosen as examples.

Abstracts describing the contents of novels

The corpus consisted of 150 abstracts. The test subjects were asked to abstract each novel in about 50-80 words. They followed these instructions rather well. The average length of the abstracts was 68 words – library professionals averaged 69 words and library patrons 67 words. Thus, there is no significant difference in the average length between professionals and patrons. However, the length of abstracts did vary greatly, both between different test subjects and also between abstracts written by a single abstractor. The longest abstract written by a library professional was 146 words, and the longest abstract by one of the patrons was 186 words. Similarly, the shortest abstracts were, respectively, 28 and 23 words long. For one subject, the length of abstracts varied from 38 to 186 words. The standard deviation among the abstracts was 27 words – this being similar for library professionals (25 words) and patrons (29 words).

The content analysis of the abstracts was completed with the aid of an observation matrix (see previous section). The contents of the abstracts could be analysed exhaustively using the categories mentioned above, (apart from a few comments about the actual reading process made by some test subjects). Thus, it seems that the aspects utilised here are sufficiently wide-ranging and exhaustive in the content analysis of novels.

<table>
<thead>
<tr>
<th>% N=3206</th>
<th>Novel's content elements</th>
<th>Novel's structure</th>
<th>Reading experience</th>
<th>Novel’s place in the history of the fiction</th>
<th>Descriptions of the author</th>
<th>Evaluation of the work</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Library professionals</td>
<td>39,2</td>
<td>6,2</td>
<td>2,2</td>
<td>0,4</td>
<td>0,9</td>
<td>1,9</td>
<td>50,8</td>
</tr>
<tr>
<td>Patrons</td>
<td>35,7</td>
<td>5,7</td>
<td>3,3</td>
<td>0,5</td>
<td>0,7</td>
<td>3,3</td>
<td>49,2</td>
</tr>
<tr>
<td>All</td>
<td>74,9</td>
<td>11,9</td>
<td>5,5</td>
<td>0,9</td>
<td>1,6</td>
<td>5,2</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2. Frequency of the categories used in content analysis

References to the author and to the cultural-historical continuum were, on the other hand, easily distinguished, as when test subjects referred to the writer, literary school, other writers or historical period in the abstracts.

Some examples of the previously mentioned categories are listed in table 1. The most typical fragments are chosen as examples.
singularity/generality and objectivity/subjectivity. Thus, one can see the same transitional process described above in these abstracts (see fig. 1.). This process proceeds from interpreting one’s own reception of a novel’s contents to a more universal reception of fiction as a holistic process.

The abstracts can be typified according to the previous four part table (fig. 3). In this study it was usual that each abstract had elements from more than one aspect. But one could also find almost pure examples of each idealised type of abstracts, which are:

1. **Plot- or thematic abstract** that describes the structure and content elements of a novel.
2. **Cultural-historical abstract** that describes the status of a novel in author’s works or in literature.
3. **Subjective or personal abstract** that describes person’s own reading experience.
4. **Critical abstract** that critiques the work objectively.

The following are examples\(^5\) from abstracts that best exemplify these idealised types – the first is about Mustonen’s novel, the next two from Dostoyevsky’s and the last from Simenon’s novel:

\(^5\) Also note how the type of the abstract affects the actual text, vocabulary used and rhetoric of the text.

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**Library clerk, female, 41 years – plot- or thematic abstract**

The book is about the everyday life in a little village in the countryside. The main character is a single parent who works in a bank. She has been divorced quite recently and she lives with her children in the same building as the bank. There is excitement in the book, when the bank gets robbed. The effect of the economic recession becomes evident when the bank is merged with a bigger bank, where the main character gets a new job. A small IT-firm moves into the former locations of the bank. Its owner is not often there, which arouses suspension. The most important things to the main character are children, family and work. The ex-husband tries to hang around, but he gets no response. There is also a romance, because in the end the bank clerk and the owner of the IT-firm fall in love with each other.

**Librarian, male, 58 years – cultural-historical abstract**

Psychological novel, a Russian classic, that represents the inner realism and precedes Freud’s psychoanalysis as well as existentialism. In it, the inward-looking, anxious clerk comes face to face with the petty realities of everyday life. One can see in the novel the writer’s turnaround from the
socially radical, individual bourgeois towards the Christian mysticism. Considerations about morality and justification of the deeds and intentions – idealism – become more important than the actual experience of the social turning point. Painfully accurate description of the soul, modern angst, social taboos (e.g. prostitution). The clerk, the main character, is totally the opposite of the Gogol’s satirically described minor clerks, as different as night from day!

**Patron, female, 57 years – subjective or personal abstract**

A bit frightening, like tearing apart layers from one's self. Familiar things could be found, not always that flattering. I wonder if there would have been less grimness, if the story had been written in a romantic tower: with the blue skies around, and free birds, no locked doors. I wonder how much society around rewrites us. Quite a lot. How much one must know in order to dare to dig deep into human soul and analyse its depths.

**Patron, female, 53 years – critical abstract**

Clear, compact novel, detective novel, that describes economically the appearance of the characters. The psychological tension is reflected finely and it maintains the reader’s interest in the plot of the book. The end is surprising, although the title foreshadows the role of Maigret in the story. Dialogue is lively, one can even hear the voices in one’s own ears. Guaranteed, lively thriller with a plot full of surprises.

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**Conclusions**

One conclusion that can be drawn from this study is that the role of library professionals influences their abstracts. Library professionals most often composed plot/thematic abstracts. On the other hand, patrons most often produced the subjective/personal abstracts. Patrons used more of the different aspects/categories presented above. Librarians, for the most part, described the novels, while patrons, in addition to that, also described their personal reading process. It was also evident that the literary competence of the reader influenced the abstracts. The most literary oriented test subjects made the most references to cultural-historical and critical aspects.

Different readers can be seen to use radically different elements while describing a novel’s contents and the aesthetic experience of reading it. Also, all of the important participants of the information process of fiction are found in the abstracts, including work, author, reader and the cultural-historical context. In-

![Fig. 4. A broad model for a search and retrieval system for fiction](image-url)
thermore, there is already some evidence (for example, from the internet bookstores) that subjective aspects are also important in fiction information systems. This, of course, is one topic that needs further study.

One clear result of studies that explore the indexing and abstracting of fictional works is the impact that the interpretation of a work of art has on the content description of that work. The impact of interpretation could be clearly noted in this study when analysing the abstracts. The structure and the content – those aspects in the novel worthy of description – were diffuse and manifold. The interpretative aspect of content description is a subject for further studies, not only in fictional works but also in scientific material.

It is apparent that fiction search and retrieval systems have to be multifaceted in order to meet the varying needs of different users. In Figure 4. a model for a search and retrieval system of fiction is shown. It consists of five main blocks (databases) that represent the different participants of the fictional communication system – works of art (texts), their subject indexing and abstracts, history of the reception by the readers, history of the writers, and cultural history. Aspects belonging to each of the blocks could be seen in the abstracts analysed in this study. Based on these findings, the most important block for the library is that of the catalogues and indexes of fictional works, including plot- or thematic abstracts of the novels. The other blocks should be generated by or together with the other participants in the information process of fiction, such as readers and writers.

With the aid of this kind of system, one can holistically document the different aspects of the meaning of fiction, for example, what the fiction is about. The building of these kinds of systems has been started, but there is much work to be done.

References


Library Classification: An Essay in Terminology

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**ABSTRACT**: Arguing that an established technical terminology is crucial to the development of a discipline, and that classification terminology is neither well settled nor widely used by its exponents, this paper provides an explanation of some of the concepts generally accepted by classification theorists. In particular, the elaborate terminology generated by S.R. Ranganathan is examined. Definitions are provided for numerous concepts, including "classification"; "characteristics" and "attributes"; the genus-species relationship; the types of classes (canonical, systems, special, and environmental main classes); the kinds of subject (basic, compound, complex); as well as concepts such as facets, isolates, arrays, and chains. Comparisons between different classification systems, specifically the Dewey Decimal Classification, Colon Classification, and Library of Congress Classification, are also made.

1. Importance of Terminology

In scientific, academic and legal communication precise terminology is not only important, but it is most essential. Effective communication cannot take place unless concepts and words denoting them are precisely predefined. Predefined words are known as technical terminology. Paradoxically, the ordinary language that a person commonly speaks is both rich and poor. It is full of homonyms; that is, one word may denote more than one concept or entity. For example, “bridge” and “cricket” have at least two meanings each. The word “order” has more than 200 meanings in the *Oxford English Dictionary*. Language is full of synonyms too; that is, a concept may be denoted by more than one word in the same language. For example “wages”, “salary” and “pay” denote almost the same concept. A word may connote different meanings in different contexts. A line of poetry has different meanings for different people. Thus ordinary language is not a perfect tool of communication. If this inexactness is allowed to occur in a scientific discipline, it will hinder the discipline’s development. A Tower of Babel will only lead to chaos and confusion instead of communication and understanding. The only solution is to have a precisely defined terminology. No discipline can progress without its technical terminology, and research is impossible without it.

S.R. Ranganathan (1892-1972) was of the considered view that scientific terminology is of double importance to librarians. Firstly, librarians and information scientists have to understand the terminology of their own discipline in order to discuss technical matters with colleagues for purposes of research and academic development in their discipline and profession. Secondly, it is important to understand the technical terminology of other disciplines in order to organize knowledge and to communicate effectively with the experts in that field.

2. Evolution of Classification Terminology

Library classification as an academic discipline is only a century and a quarter old. Its teaching and research has slowly gained momentum. Since the 1950s it has quickened its pace of research and development
and in the process has evolved a terminology of its own. However, it must be admitted that its terminology is neither well settled nor widely used by its exponents. S.R. Ranganathan did generate a very elaborate terminology that still seems too advanced for the time. He was a great exponent of terminology, but librarians are afraid of using his terms. Concepts used by other theorists of classification, such as H.E. Bliss (1870-1955), W.C.B. Sayers (1881-1960) and the Classification Research Group in London (established in 1952), who have their own terminologies, usually differ from one another. However, some of Ranganathan's terms and those of others are accepted universally. This paper endeavours to explain terms in a descriptive essay.

3. Classification Terminology

Classification pertains to the discipline of logic and pervades every small activity of life. Classification means to divide objects/entities (both abstract and concrete) on the basis of their differences or, conversely, the grouping of entities on the basis of their similarities. Classification is any process of dividing, sorting, grouping, arranging, ordering, ranking, mapping and correlating.

3.1 Characteristics and Attributes

This grouping, division, or ranking of entities is done on the basis of criteria called characteristics. Thus characteristics are the bases for the division of a group. For example, a class divided on the basis of "gender" produces three groups - male, female and hermaphrodite. "Sex" is the characteristic of division here. On the other hand, attribute is any quality, parameter, or factor possessed by, or inherent in, an entity. For example, a group of human beings may have many attributes such as gender, religion, race, nationality, social status, and income level, as well as physical attributes such as height, colour, weight and many more. An attribute which creates at least one division in a group is called a characteristic. For example, in a class of "women" being female is one attribute possessed by all the members. However, it is not a characteristic as it cannot produce any division in the group. Thus a characteristic is a non-common attribute used to divide a class.

3.2 Genus-species

The first group to be divided into smaller groups is called a genus and its divisions are termed to be species. For example, furniture is a genus and its species are tables, chairs, beds, etc. Now let us take "table" as a genus, then its species (produced on the characteristic of function) are: office table, study table, dining table, etc. In other words, a characteristic when added to a genus produces species (genus + characteristic = species). Hence genus and species are as relative as the upper and lower links in a chain. An entity could be a species as well as a genus, as a person can be both a son and a father at the same time.

4. Knowledge Classification

Classification includes both abstract and concrete entities. When the entity to be divided or organized is knowledge it is called knowledge classification. Knowledge has been defined as the sum total of ideas, facts, experiences, recorded emotions, fiction and myth conserved by human society. Knowledge is infinite and ever expanding. Books and other documents are recorded knowledge.

5. Kinds of Library Classification

When entities are books and other such items of information, their classification is called library classification. Library classification has also been defined as classification of knowledge as contained in books and other reading materials. It can be defined as the arrangement of informational material in a library/information centre in a way that is most helpful for browsing, locating and organizing the contents. Library classification is ostensibly utilitarian in the sense that it has an important purpose. Library classification has many names and aims. It is book classification when it is used to arrange books and other macro-documents on the library shelves. When it is used to arrange the records that represent the books (i.e. surrogates such as entries in catalogues or bibliographies) it is called bibliographic classification. The Dewey Decimal Classification (DDC) was designed to be a book classification, whereas the Universal Decimal Classification (UDC) was designed to be a bibliographic classification. The term bibliographic classification is also used to describe depth or detailed classification. (Incidently, bibliographic classification is also the name of a classification system designed by H.E. Bliss). Detailed classification required for micro-documents is described as depth classification by Ranganathan. Compared with other systems, the Library of Congress Classification is, relatively speaking, a depth classification. A classification that is not too detailed and meets the requirements of small libraries is called a broad classification. Rider's International...
Classification (Rider 1961) and early editions of the DDC are examples of broad classification. Classification for a specific area of knowledge, for example economics, occupational safety, environmental engineering, women’s studies, leather technology, etc. is known as special classification. Special classifications are inevitably depth classifications. A classification of the entire universe of knowledge is known as a general classification. Some call such a system a universal classification.

Library classification, whatever be its kinds, has been defined comprehensively by Rita Marcella and Robert Newton (1994, p.1) as:

The systematic arrangement by subject of books and other learning resources and/or the similar systematic arrangement of catalogue or index entries, in the manner most useful to those who are seeking either a definite piece of information or a display of the most likely sources for the effective investigation of the subject of their choice.

The purpose of classification is to facilitate the optimum use of library resources. It is a tool for information organization and retrieval both in manual and automated retrieval systems.

A true and comprehensive definition of classification was formulated by FID/CR in 1964 (Atherton 1965, p.544):

By “classification” is meant any method creating relations, generic or other, between individual semantic units, regardless of the degree in hierarchy contained in the systems and of whether those systems would be applied in connection with traditional or more or less mechanized methods of document searching.

6. Disciplines and Basic Subjects

In a modern library the arrangement of documents is usually by subject. Thus a subject is the characteristic of division for the arrangement of documents. A subject is a systematized homogeneous and cohesive group of ideas or a chunk of knowledge whose depth (intension) and breadth (extension) are comfortably within the intellectual competence and the field of specialization of a normal intellectual person. However, in library classification we are mostly concerned with what are known as specific subjects. A specific subject is always determined within the context of a document. The specific subject of a document is defined as the subject of the document whose extension (scope/breadth) and intension (depth/specificity) are equal to the thought contents of a document.

The totality of ideas or subjects is known as the universe of knowledge and has been divided into major areas called disciplines. A discipline is a major contiguous area of knowledge formed on the basis of either similarity of the objects of study (i.e. whether natural objects or social issues); or obtained by a similar mode of study or method of acquiring knowledge (i.e. whether imaginative or empirical). Classically speaking, there are three major disciplines of the universe of knowledge:

- Sciences (study of natural objects)
- Social sciences (problems of society)
- Humanities (imagination, apperception)

However, connotations of a discipline vary from time to time. Modern classification systems are divided by discipline - a breakthrough made by Melvil Dewey (1851-1931). A subject may fall under various disciplines.

Disciplines are further divided into partially comprehensive main classes, a generic name for continuous groups of main classes such as Mathematical sciences, Physical sciences, Plant sciences, Earth sciences, etc. Further division is into main classes. A main class is a conventional, but very cohesive, area of knowledge. “Main class” is a social phenomena. The scope and total number of main classes varies with the growth and obsolescence of knowledge. The number of main classes in a classification system is usually dictated by the kinds of symbols used by a particular system. A traditional subdivision of an old main class is known as a canonical class. For example, Heat, Light, Magnetism and Electricity are canonical classes of the main class Physics. Similarly, Algebra, Geometry, and Analysis are canonical classes of the main class Mathematics. A new main class such as Library science, Journalism, Computer science, etc. does not have canonical classes. Main classes expounded from a school of thought, as exemplified by Marxian economics, Newtonian physics and Homeopathic medicine, are known as systems main classes. A main class studied from a specialized viewpoint, such as Aviation medicine, Paediatrics, Sports medicine or Small scale economy, is known as a special main class. When a subject is studied only in a given environment (social or physical), it is an environmental basic subject. War economy, High altitude engineering and Tropical medicine are examples of environmental main
7. Categories, Facets and Isolates

A solitary, unattached idea that cannot be further subdivided, and by itself cannot form a subject is called an isolate. For example, the terms wheat, child and India are isolates, as by themselves they are vague. These have meanings only in the context of a basic class. For example, Wheat diseases, Child psychology and Indian history have meanings. An isolate is the ultimate division of knowledge. It cannot be further subdivided. Going back a little, Ranganathan defines a compound subject as a basic subject having one or more isolates. Thus, one or more isolates in the context of a basic subject form a compound subject, while a basic subject is a subject without an isolate idea.

Isolates are grouped on the basis of common characteristics into what are called facets.

A facet is thus a totality of the isolates obtained on the basis of a single train of characteristics applied to a given entity. In a main class there may be a number of facets. For example in Education, types of educands is one facet; another facet may be teachers, yet another would be teaching techniques; and curriculum is yet another. All the isolates under teaching techniques form one facet. In the main class Literature, there are four facets belonging to the Personality category, namely language, form, author, and name of the literary work. A particular entity in a facet is a focus, or foci in the plural. If language is a facet then English language is a focus of that facet.

The totality of the facets, having a very broad or pervasive common characteristic, form a category. For example, in Library science all the facets pertaining to the kind of library (i.e. academic, public, special, etc.) form a category named the Personality category. Yet another category is the library activity category (i.e. acquisitions, processing, services and preservation) called the Energy category in this case.

A category is a highly generalized division of knowledge. Ranganathan postulates that a subject constitutes, at the most, five fundamental categories, namely Personality, Matter, Energy, Space and Time. These are the five, and only five, fundamental categories he postulated. In other words, any concept of the universe of knowledge could be assigned to only one of the five fundamental categories. J. Kaiser (1911) and Barbara Kyle (1962) presumed two categories. Some classification theorists take “facet” and “category” to be synonymous terms. However, in Ranganathan’s theory a category may have many facets occurring in Rounds and Levels of that category. As already stated, the Personality category in “O Lit-
erature" (in CC) has four facets known as Levels of Personality.

7.1 Arrays and Chains

Facets and isolates are arranged in what are called arrays and chains. An array is a sequence of coordinate (equally ranked) classes arranged in some definite order. For example, all the sons and daughters of the same parents form an array. All the geographical continents of the earth form an array, and all the countries of the world, when arranged in some order, form another array. Systematic or utilitarian arrangement of members of an array is called a helpful sequence. There are many principles by which to achieve a helpful sequence; these include chronological, geographical, complexity, evolutionary, alphabetical, and other such predictable or formulated order of closely related classes. The order of main classes in J.D. Brown’s Subject Classification (1908) is the cosmic evolutionary order of matter-force-life-mind-record. In the Bliss Bibliographic Classification (BC) the order of main classes is by educational and scientific consensus. In Ranganathan’s Colon Classification the overall arrangement of the sciences is from abstract to concrete; within this sequence the further arrangement is by principle of dependency where practice follows theory.

A chain is a sequence of classes in successive subordination. That is, all of the members are of unequal rank and are arranged in the order of constantly decreasing extension and increasing intensity. The order in a chain is from general to specific or in the reverse order of specific to general. For example, World, Asia, India, Maharashtra and Mumbai form a chain of classes in this or the reverse order. Similarly, Social Sciences, Economics, Finance, Money and Banks form another chain of classes. The arrangement of entities in a chain is always hierarchical and linear. It expresses only the genus-species and the whole-part relationships.

8. Classification Schedules

Library classification invariably requires written lists of classes and their subdivisions arranged in a systematic way along with the corresponding symbols denoting them. This systematic elaborate and tabulated list of classes is known as a schedule. A schedule, along with an alphabetical index of classes referring to its symbols, and with some auxiliary concepts called common subdivisions, is known as a classification system. There are various systems of classification, for example the Dewey Decimal Classification, Ranganathan’s Colon Classification and the Library of Congress Classification. There are about half a dozen living general classification systems. An index is an alphabetical approach to the systematic schedules and auxiliary tables. Topics that are scattered by discipline in the schedules are collocated in the index, thus showing the relationships among them. The relative index is a significant contribution of Melvil Dewey which has been adopted by other classifications.

In addition to the schedules that are the terra firma of a classification system, there are auxiliary tables of recurring concepts, for example geographic isolates, time isolates, language isolates, forms of presentation of documents such as a dictionaries, conference proceedings, data tables or physical formats (e.g. book, journal, floppy disk, map, CD-ROM, or videotape). These usually represent the various non-subject aspects of documents or some peripheral but recurring subordinated subject aspects. These recurring concepts, along with their symbols, are listed once and for all and are usually given preceding the schedules. These auxiliary concepts, given in seven tables in DDC, are known as common isolates in CC and as common auxiliaries in the UDC.

The schedules may be in either printed or electronic form (i.e. on a floppy disk or CD-ROM). The DDC 21st edition (1996) is available in a CD-ROM form entitled Dewey for Windows, whereas the Broad System of Ordering (BSO) is now only available on floppy disk. A designer of a classification system is known as a classificationist. S.R. Ranganathan, Melvil Dewey, H.E. Bliss, C.A. Cutter, and Jack Mills are some of the outstanding names among classificationists. A person who operates these systems is known as a classifier or a classification practitioner. The majority of the librarians who work with classification are classifiers. In between the two are classification theorists, those engaged in the theory and research of classification.

There are, broadly speaking, two species of library classification systems. Enumerative classification is classification in which all classes of the past, present and the near future are enumerated systematically along with their corresponding symbols. In other words, the symbols or series of symbols for a class are available ready-made and the classifiers do not have any need or authority to construct a notation. The Library of Congress Classification, Rider’s International Classification and the Dewey Decimal Classification are
examples of enumerative classification systems. In fact, at present no general classification system is purely or absolutely enumerative. Enumerative classification systems are sometimes contemptuously described as mark and park systems, not based on any theory.

The other species of classification is known as faceted classification. In fact, classification, concepts called isolates are enumerated under various categories and facets of each main class; and the system provides rules for combining these isolates in a coordinated way. The sequence in which these isolates are combined to form the complete number for a subject is called a facet formula. In simple words, it is the citation order of facets and their isolates. Generally the order of facets is from concrete to abstract or from specific to general. Ranganathan formulated two important principles of facet sequence, namely the wall-picture principle and the whole-part principle. The standard citation order as given by the Classification Research Group (UK) is: Things-kinds-parts-materials-properties-processes-operations-agents, but the ordering of documents on the shelves or their surrogates in a file is from the general to the specific. It is the reverse of the citation order and is called the principle of inversion. It is achieved by appropriately fixing the ordinal value of digits in the notation in the classification system. No subject, except a basic subject, is given a ready made number in such a classification. The Colon Classification and the Bibliographic Classification, 2nd edition (BC2) are two outstanding examples of faceted classification systems. S.R. Ranganathan, in his characteristic manner, lists five species of classification: a) enumerative, b) almost enumerative, c) almost faceted, d) rigidly faceted and e) freely faceted. UDC has been described as an “almost faceted” classification. Rigidly and freely faceted are the earliest and latest states of the Colon Classification. Such a classification invariably involves what is known as facet analysis which is to break a subject into its various facets according to its postulates and principles. Actually, facet analysis is preceded by subject analysis, i.e. the determination of the specific subject of the document. In other words, this process is the determination as to what is fashionably known as aboutness. Aboutness can be decided upon by reading the title, table of contents, blurb, preface, and other parts of the document, and is determined in the context of users’ needs. This analysis is followed by synthesis of the concepts using an analytico-synthetic classification. Various facets have to be pre-coordinated by the classifier according to what is known as the facet formula. Facet analysis and the naming of general categories of facets are prerequisites to a facet formula. If the design of a faceted classification is guided by a pre-formulated set of postulates and principles then it is called an analytico-synthetic classification. Although the UDC is a faceted classification it is not an analytico-synthetic system. The CC is both faceted and analytico-synthetic. BC2 can safely be described as an analytico-synthetic system.

9. Notation and Class Number

So far we have been deliberately using the vague term “symbol” as a code to denote a class. Preferably, we should have used the term “notation”. A notation is a series of brief symbols denoting subjects and their aspects, as for example, B for Mathematics in CC and 954 for History of India in DDC. Every discrete symbol in the notation is called a digit. For example, 954 has three digits and L2.4 has four digits.

These symbols may be numerals, letters, mathematical symbols and punctuation signs. Bibliographical classifications, of necessity, have to use punctuation marks such as , ; + & or some mathematical signs such as + / ± ( ) to precede or envelop facets. These function as signposts or indicator digits. For example in CC, in L:3, the colon preceding the digit 3 indicates that the facet “3” belongs to the Energy category, as “: ” is an indicator digit for the energy facet. Similarly in UDC, in 5(05) Science serials, the (05) indicates serials/journals, as the (0..) is an indicator for forms of documents while (1/9)indicates geographical areas in the UDC. In CC the indicator digits were formerly known as connecting symbols. A notational system consisting of only one species of digits is called pure notation. Rider’s International Classification used pure notation of Roman capitals. Ranganathan’s system uses a highly mixed notation comprised of capital and small letters of the Roman alphabet, decimal numerals and punctuation marks.

Notational digits are organized into a system to form a sort of language with defined rules and procedures to represent and combine different subjects and their aspects. Ranganathan ambitiously describes notation as an artificial language of ordinal numbers. Being a language, it is also known as a notational system. These numbers have only ordinal value. That is, they only determine the sequence of digits and are not a measure of any quality or cardinal value. Therefore, for example the digits “A,b,9” have only ordinal value. On the shelves the order of these notational...
symbols will be, for example, “b, 9, A” or any other order prescribed by that particular system. The ordinal value of the digits has to be prefixed by the classificaitonists to have a desired arrangement of documents on the shelves. The usual arrangement is from the general to the specific, which is pedagogic in nature and considered helpful for self learners. Such an order is helpful for browsing the shelves. The state of a notation that is short, or less lengthy, and less mixed is known as simplicity of notation and is a desirable quality in notation. The notation of DDC is pure and, for the most part simple, although at times it can be quite lengthy. A notation with pronounceable notation, such as Fab, God, Jop, Mob, and Tim, is exemplified in D.J. Foskett’s London Education Classification. The facility and ability of a notational system to accommodate new subjects at proper and logical places in the scheme is known as the hospitality of notation. This is an essential quality of a notational system. Another desirable quality of notation is mnemonicity. A mnemonic notation is one in which a concept/isolate recurring in the schedules is denoted by the same notational digit. For example, in DDC:

954 History of India
915.4 Geography of India
315.4 Statistics of India

Also

420 English language
820 English literature

In this list -54 stands for India and -20 stands for English. In CC “3” denotes physiology, for example:

G:3 General physiology
I:3 Plant physiology
K:3 Animal physiology
L:3 Human physiology

In some systems P may stand for Philosophy and T for Technology; these are literal or alphabetical mnemonics. Mnemonics are simply aids to memory and are desirable in a notational system but are far from essential if they conflict with the logical order or other essential functions of notation. Ranganathan also advocated seminal mnemonics to denote concepts with their inherent/spiritual numbers, as exemplified in 1 for God, or World, and 2 for Constitution or Structure. Not only this, but Ranganathan would assign Functions, or Physiology the same notation 3. To denote the 1st order by 1, 2nd order by 2 and 3rd order by 3 is a weak or obvious form of mnemonic notation.

9.1 Class Number, Book Number, Call Number

The subject of a document when transformed into notational form is known as a class number. For example, 954 is a class number for “History of India” and the class number 954.025 means History of Moughal India in the DDC; and L185:2 denotes the “Anatomy of the Human Eye” in CC. A class number is thus a translation of the specific subject of the document into an artificial language of ordinal numbers called notation. Although it exaggerates the role and power of classification, Ranganathan equates classification with translation. The act of designing classification systems, or of assigning appropriate class numbers from a classification system to a document is also known as library classification.

However, a class number alone is not sufficient for precise and ultimate arrangement of documents on shelves or the arrangement of their surrogates in files. For example, there may be a dozen or more books on the “History of Moughal India” in a library having the same class number (e.g. 954.025). The problem arises as to how to further arrange (i.e. subarrange) all of these books on shelves. Any device for subarrangement of documents having the same class number is called a book number. There are two major categories of book numbers: a) chronological system and b) author marks. In the chronological system, book numbers subarrange books by the year of publication of the book. This method was invented by W.S. Biscoe (1853-1933) of the USA and further refined and perfected by S.R. Ranganathan in his Colon Book Number. With respect to the second system, author marks are used to arrange books alphabetically by author, or by title in cases where there is no author. This system is largely associated with the name of C.A. Cutter (1837-1923), who, in association with Kate E. Sanborn, devised a long table to convert the names of authors into alphanumeric notations. There are also a few other such author tables for the purpose. So such numbers are also called author numbers. Sometimes author numbers are understood as being synonymous with book numbers. Author numbers are also known as author marks. Book numbers may also take into account such attributes as language, edition, accession number, title and volume of a book. A book number is a satellite of a class number.

For the convenience of administration and ease of use, entire library collections are broken into parallel collections, for example Reference Books, Textbooks, Rare Books and Serial Publications; each having its
separate section. Within each section the documents are arranged by class and book numbers. Therefore, along with the classification and book number there should be a symbol to indicate the section in which a book is placed. These symbols, called **collection numbers**, may be alphabetical or even arbitrary. For example, TX for Textbooks, RB for Rare Books, R for Reference books and MS for Manuscripts are collection numbers. The combination of collection number, class number and book number, taken in this order, is termed a **call number**. A call number uniquely specifies the location of the document in the library and is designed to be unique for each document in a library. The term call number originated from the fact that in the days of closed stacks the books used to be called out from the library stacks by these numbers. In open access libraries the readers have free access to stacks and the books are no longer called out by these numbers; yet the old term lingers and is in vogue in the standard terminology of library classification.

10. **Alphabetical List of Terms Explained**

Aboutness
Alphabetical mnemonics
Analytico-synthetic classification
Array
Artificial language
Attribute
Author marks
Basic class
Basic subject
Bibliographic classification
Book number
Book classification
Broad classification
Browsing
Call number
Canonical class
Category
Chain
Characteristics
Characteristics
Chronological book number
Chronological book number
Citation order
Class number
Classification
Classification theorist
Classification system
Classificationist
Classifier
Collection numbers
Common auxiliaries
Common isolates
Complex subject
Compound subject
Connecting symbols
Cutter author table
Decimal notation
Depth classification
Digit
Discipline
Enumerative classification
Environmental main class
Facet analysis
Facet
Facet formula
Faceted classification
Focus
Fundamental category
General classification
Genus
Helpful sequence
Hierarchy
Hospitality of notation
Indicator digit
Isolate
Knowledge
Knowledge classification
Levels
Library classification
Main class
Mixed notation
Mnemonic notation
Notation
Notational system
Ordinal value
Partially comprehensive main class
Phase analysis
Phase
Principle of inversion
Pure notation
Recorded knowledge
Relative index
Rounds
Schedules
Seminal mnemonics
Special classification
Special basic subject
Special main class
Species
Specific subject
Subject analysis
Subject
Systems basic subject
Systems main class
Universal classification
Wall-picture principle
Whole-part principle

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We are pleased to announce that the new ISKO website is now accessible via http://www.isko.org/
The site includes details about
• new projects and developments in the KO field
• the history and objectives of ISKO
• how to become an ISKO member
• upcoming and past conferences and workshops
• journals and conference proceedings published by ISKO
• recent journal articles
• the members of ISKO’s Executive Board and Scientific Advisory Council
• ISKO’s national and regional chapters
• general and special classification schemes

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FID/CR News 51

Nancy Williamson
FID/CR News Editor

Derek Langridge

The international classification community is saddened by the sudden death of Derek Langridge on June 13, 2000. Derek was a long time member of the Classification Research Group. In The Bliss Classification Bulletin for 2000, his colleague Douglas Foskett wrote that he was "a traditionalist, by inclination, but took a keen interest in modern theories of philosophy, especially of education". He was a strong supporter of the work of S.R. Ranganathan and participated actively in the CRG’s work on the second edition of the Bliss Bibliographic Classification. He wrote numerous articles and several books. Particularly notable additions to the literature of classification theory and practice are his Classification and indexing in the humanities (1976) and Subject analysis: principles and procedures (1989). Derek Langridge will be greatly missed.

Universal Decimal Classification

With the exception of the Tables themselves, one of the most important publications for UDC users is the Extensions and Corrections to the UDC (E&C) published by the UDC Consortium. It is an annual publication, published in November each year, covering the changes in the UDC that have taken place over the past year and is an essential tool for UDC revisers and practitioners. Two of the most recent volumes – Nos. 21 (1999) and 22 (2000) – are analyzed here.

As is the custom with E&C, issue number 21 contains a number of brief articles that present the points of view of UDC users. A new feature in the section on “Comments & Communications” is “Notes and Queries”, which appears for the first time. In its initial appearance, members of the UDC Editorial Board have made the comments. However, the Editor, Professor Ia MNullaine, encourages the active participation of all readers and UDC users in general and invites them to send their comments and suggestions as potential contributions to future "Notes and Queries". Users also contribute articles as exemplified here by “La Classification Décimale Universelle (C.D.U) et le monde francophone"; prepared by Jacques Burlet, a francophone member of the UDC Consortium and “Romanian Thesaurus "; by Yvonne Dumitrescu and Constanta Dumitraconiu. The latter describes the development of a thesaurus based on UDC and states the reasons for this approach and the methodology used in its development. It is a work in progress and is being created discipline by discipline. At the time of writing, individual thesauri had been created covering the areas of Librarianship, Philosophy, Religion and Theology, Biology, Botany and Zoology, and Linguistics and Literature. In another article on “Searching with words: Re-use of subject indexing” Gerhard Riesthuis examines the possibility of converting pre-coordinated UDC notations into post-coordinated notations for purposes of searching individual components and the addition of text words to the components for use in searching. An article by Stephen Parker, former Executive Director of FID, on “FID, UDC and the Future” explains the history and development of the relationship between FID and UDC.

Proposals for revised UDC tables are a regular feature of E&C. This makes it possible for UDC users to comment and suggest additions and changes prior to the final publication of revised authorized schedules. In this issue, proposals for new schedules include Class 2 Religion and Theology (superceded by authorized schedules in E&C 22) and parts of Class 61 from the ongoing project to revise the Medicine class. Revised UDC tables (i.e. authorized changes) include tables and parts of tables from various parts of the classification. In volume 21, the most significant changes are those to the geographical Table 1e including a complete revision and expansion of (71) Canada. Also found here is the new table of “Common auxiliaries of properties”, which replaces the previous “Common auxiliaries of point-of-view”. This important and extremely useful revision affects the entire UDC system.
Other important and substantial changes include 338.48 Tourism and 502/504 Environmental Sciences and Conservation of Natural Resources.

In E&C 22, appropriately, the lead article in the November 2000 issue is a brief paper by Alan Stevens, Chairman of the UDC consortium entitled “UDC in the New Millennium”. In it, he forecasts two important upcoming events early in the millennium – the MIRACLE project to create a world wide virtual library of music in Braille and the forthcoming publication of a new edition of the Guide to the use of the UDC prepared by Professor Ia McIlwaine. As is customary, the first major contribution to the volume is The “Report of the Editor in Chief” of the UDC, Professor McIlwaine. In her report she refers to the strong staff support she has had over the past year and its importance to the continuing work on UDC. In the ongoing revision of UDC, her report highlights a new schedule for Class 2 (Religion) that for the first time is free of Christian bias and cites the importance of facet analysis as a major principle in this edition. The report further describes the involvement of the Editor and her assistants in the many UDC related international activities including a Seminar in Borås, Sweden, the ISKO conference in Toronto, Canada, and IFLA in Jerusalem where a forum was held for UDC users. As the Editor herself points out “classification is thriving”.

As customary, this edition of E&C contains a number of articles on various aspects of UDC and its application in various parts of the world. “VINITI – the All Russian Institute for Scientific and Technical Information”, by Yu. A. Arsky and Oleg P. Nesterov briefly describes the history and background of that organization, which is the largest information centre in the Russian federation. Its mandate is to provide information support for scientists and specialists in the natural and technical sciences. VINITI is a user of UDC and the history of that relationship is outlined and its plans for the future noted. Among VINITI’s plans are the continued publication of the fourth Russian full edition of UDC, the preparation of Russian electronic publications including a full electronic version of UDC in Russian for inclusion in a multilingual UDC CD-ROM, as well as the availability of the Russian UDC via the Internet. An article by F. Wimmer entitled “Der apostroph in der Dezimalklassifikation” (“The Apostrophe in UDC”), translated by Geoffrey Robinson, endeavours to show “how the introduction of an originally ingenious simplification into the UDC ... became in course of time divorced from its original purpose through misinterpretation by inexperienced revisers” resulting in unnecessary weakness in the system. A very detailed article, it traces the evolution of this phenomenon. Ultimately the author concludes that in future the apostrophe should be limited in use to its original meaning to avoid further inconsistencies. In his article “Time out of Mind”, Geoffrey Robinson of the British Standards Institution (BSI) provides a critical analysis of UDC Table 1g ‘common auxiliaries of time’. Discussion focuses on three particular problems – the auxiliaries of the past “311”, present “312” and future “313” that have been deleted in favour of more precise designations using actual dates; the use of the four digit base (e.g. “3442” daybreak) which is inconsistent with the rest of UDC; conceptual problems in terminology; and problems in filing order. His ultimate conclusion is that “with its terminological oddities, frequent duplications, muddled conceptual analysis, insoluble filing problems and gimmicky notation, this table is a bit of a mess”. To remedy some of the problems would require ruthless cutting – but it would be useful to know how many users use this table. Following Robinson’s paper there is a series of 4 articles on the use of UDC in various countries – in Lithuania, “Martynas Mazvydas: National Library of Lithuania” by Marija Gobyte, in Slovakia “Bilingual Slovak/English UDC Master Reference File on CD-ROM” by Anna Kucianova and Stanislav Psohlavec “Classification and Subject Indexing in Estonia: New Developments in 1999-2000”, by Marje Aasmets and “Developments in Portugal Regarding Classification and Indexing (1999-2000) by Julio Vaz. The final two articles are “The MIRACLE and the Blind Musician” by Vera Wessels describes a project designed to create a tool that will enable libraries and information centres to pool resources in Braille format. A familiar concern with UDC has always been its notation – David Strachan suggests that there is “A Chance to make UDC notation more computer friendly”. In doing so he focuses on the double role of the point (.) As previously noted a large portion of each edition of E&C is devoted to proposals for new tables and authorized revised tables. In this volume one proposal is included – the proposal for 615 (Diseases and Pathology) to be included in the revision for Class 61 (Medical Sciences). This is last of the general classes for the new 61. Future work will focus on the classes that deal with the systems of the body which will build on the more general classes (611/615) and draw from them. The “Revised tables” include minor revi-
sions to auxiliary tables 1d, 1e and 1k and the most important authorized revision is a completely new table for the aforementioned Class 2 (Theology and Religion). It is revolutionary in terms of existing UDC tables and is an extremely important forecast of the UDC of the future. The new Class 2 dispenses with multilevel auxiliaries and simplifies a proposal made in 1993. This schedule consists of only two elements – a main table of religions and faiths and a single auxiliary table that can be applied to any faith. As the preamble indicates "the auxiliary table is a fully faceted and inverted schedule, based on principles of facet analysis and citation order and reflects the structural and theoretical make-up of the Bliss Bibliographic Classification, but is not directly derived from that system". This auxiliary table can be used with any class in the main table. Cancellations from Class 2 are listed. Other revisions include parts of Class 364 (Social Welfare), cancellations from 369, changes in 53 through 59, amendments to Class 66 (Materials), 7.033/.038 (Mediaeval and Modern Styles of Art) and 93 (Historiography). Also there is an extension of the area notations for the USA to make them hierarchical and searchable by truncation. All in all, there are numerous changes that involve new classes and new numbers and many cancellations of old numbers. It is essential that UDC revisers and practitioners become aware of these important revisions.

Other UDC publications

Two recent publications that are of importance to UDC users have been prepared and published by the British Standards Institution. For the first time UDC has been produced in a compact edition for use in training and personal use: (UDC – The pocket edition. London: BSI, 2000. ISBN 0-580-33045-1 Price £15). As described by the publisher, it "contains about 4000 entries and preserves the essential characteristics of UDC while eliminating material that is not essential for small scale use." It is based on the Master Reference File (MRF) of 61,000 entries and includes the most recent updates, but excludes highly technical details. It also contains a new introduction explaining the structure of UDC and providing practical advice on its use. It is invaluable for use by learners, as well as for staff training, for organizing electronic files and for classifying small collections. Also published as a separate publication is the Universal Decimal Classification: place tables for the UK and Germany. London, BSI, 1999. (BS 1000:Aux 1e(41/435): 1999. ISBN 0 580 33068 0. Price: £80.00 (members £40.00). This publication incorporate the administrative changes in the UK and the reunified Federal Republic of Germany. It is an “extended edition” of the UK and Germany parts of Table 1e as it appears in the UDC Master Reference File. It covers the administrative units of both countries down to the tertiary level – districts and equivalent in the UK and Kreise and equivalent in Germany. Thus it permits highly detailed indexing and retrieval of metadata related to these particular jurisdictions.

For further information and enquiries contact BSI Customer Services, 389 Chiswick High Road, London W4 4AL (e-mail: to order: orders@bsi.org.uk; enquiries: info@bsi.org.uk).

IFLA Section on Classification and Indexing

The year 1999/2000 has been a very busy year for the Section. The Standing Committee has a number of projects underway. The Working Group on Principles Underlying Subject Heading Languages (SHILs) published its report in June 1999. “Requirements for a format for classification” was expected to be approved at the Jerusalem Conference. Work on the “Guidelines for the construction of multi-lingual thesauri” and the activities of the Working Group on Subject Access of Web Sites and Digital Libraries are works in progress. The Standing Committee also participates in some cooperative projects, specifically in cooperation with the Division of Bibliographic Control on OPAC displays and in the work of the Permanent UNIMARC Committee.

Looking to the future, the Section is planning a satellite conference on “Subject Retrieval in a Networked World” to be held at OCLC in Dublin, Ohio, August 14-16, 2001, immediately prior to the Boston Conference of IFLA. “The conference will explore different approaches to the subject retrieval of information and will provide an opportunity to exchange views and hear researchers in the forefront of retrieval in the Internet Age.” It will focus on the following themes: Language and communication in knowledge organization and retrieval; New retrieval technologies for a networked world; Retrieval systems design and implementation; Search engines, classification schemes and thesauri in a networked environment; and Metadata and subject retrieval. The conference fee is $250.00 US (prior to June 15th); $300.00 US (June 15th – July 15th). Numbers are limited and late registration will not be accepted.

For further information please contact Amy Summers, e-mail summersa@oclc.org.
The Section was very active in the programmes of the Jerusalem Conference in August 2000. Three papers were presented in the Section’s full programme under the theme “Current issues in subject retrieval”. In the tradition of the Section’s policy of including presentations from the country that is the venue of the conference, Elhanan Adler (Israel) presented a paper on “Multilingual and multiscript subject access: the case of Israel”. In his paper, Adler indicated that several different approaches have been taken by libraries in solving this problem. In academic libraries the trend has been toward subject heading and keyword searching in English, whereas public libraries have moved more slowly in evolving from classified catalogues into Hebrew language subject headings. The paper describes the history and background of the “Babel” of languages that exist “throughout Israeli bibliographic practice”. The complexity of the situation is very evident when one considers that the practice has been to maintain separate catalogues for each script (i.e. Hebrew, Arabic and Latin). Many libraries also maintain catalogues in the Cyrillic alphabet. The OPAC brings its own challenges but keyword retrieval, with limited recall and low relevance, using titles, subtitles and some other data fields, may become an alternative to subject headings. Vanda Broughton (UK), in her paper “A new classification for the literature of religion”, examined the general problems to be faced in the classification of religious literature, including the Christian bias of existing systems, the proliferation of specialized vocabulary, and the variations in the understanding of the meaning of terms among different religions. Following from this Broughton described the newly revised Class 2 (Religion) for UDC. This revision makes full use of facet principles and structure modeled on the second edition of the Bliss Bibliographic Classification. Examples of its application are included. The third and final paper by Moshe Vizhaki and Tzipi Shahar (Israel) was the presentation of “A draft version of a consolidated thesaurus for the rapidly growing field of alternative medicine”. The authors described alternative medicine as an emerging and widely recognized field of medicine with a significant literary output. Research focused on the retrieval of 4000 articles from 18 databases published between 1985 and 1994. The keywords found in titles and descriptors were then used to create a thesaurus. The principles and methodology used are described. Two example of descriptors – “Chinese medicine” and “Complementary medicine” together with their lead-in vocabulary, narrower terms (NT) and related terms (RT) are included. An interesting finding in the search was the more than 40 synonymous terms expressing negative attitudes toward various aspects of alternative medicine. The authors are asking for feedback that could aid them in improving and further developing the list for practical use.

At the Jerusalem Conference, in addition to its full formal programme, the Classification and Indexing Section held a Workshop on the theme “Crosswalks between languages, cultures, religions in classification and indexing”. Among the presentations were two papers, which are available through IFLANET. The first, by Friedrich Geisselmann (Germany), was on “The indexing of electronic publications: ways out of heterogeneity.” The general focus of this paper is the differences in terminology and language used across databases. It recognizes that interdisciplinary and multiple database searching is made more difficult when libraries and specialist information systems use different classifications and thesauri. In this context, the author’s frame of reference was a project called CARMEN being carried out at the University of Regensburg. The purpose of the project is to enable integrated searches for subject matter in distributed data collections by coping with conceptual differences using cross concordances. Three possible models are identified – a centralistic approach to indexing, organization on a “distributive basis”, and a model that “aims at the standardization and acceptance and spreading of metadata”. None of these appear to be a satisfactory solution. As an alternative the author proposes the use of the “shell model” in which coordination and administration of the system is substituted for centralization. It permits 4 levels (or shells) of indexing, moving from a highly relevant topic to the least relevant. As described in the paper, CARMEN is a work in progress. The requirements for the a project are a methodology for handling cross concordances, programming procedures for depicting them, and the development of a prototype cross concordance between two or more schemes. Up to the point of writing, four classification schemes have been stored and the researchers hope to be able to include DDC. Documents to be included have been handled in different ways – documents without indexing, documents that have been classified, documents with meta data, and documents without metadata stored in layout-oriented formats (e.g. PostScript, PDF). One of the aims is to “design better metadata constructs, and to develop ... procedures to generate metadata automatically”. Other approaches will be to “try to attain con-
tent and formal categories by means of deductive-heuristic methods from the documents”. Another procedure will focus on creating relations with quantitative-statistical procedures. Finally a retrieval system for XML documents is to be constructed. The author’s final observation is that “indexing [of digital publications] becomes far more difficult than that for books”. Unfortunately the figures that accompanied this paper are not included in the version of the paper contained on IFLANET. In a second workshop presentation, David Wilk (Israel) discussed “Problems in the use of Library of Congress subject headings as the basis for Hebrew subject headings in the Bar-Ilan University Library”. The project described began in 1983 at the time when the library was computerizing its system and a decision was made to assign Hebrew subject headings to books and non-print materials in Hebrew. The subject headings are based on the Library of Congress Subject Headings (LCSH). Disadvantages of LCSH were encountered including political bias, Christian orientation, and insufficient specificity for a large and varied Judaica and Israeli collection. This paper describes how the library handled these problems. Topics discussed include homonyms, Hebrew language structure, Hebrew vs. non-Hebrew terminology, user friendliness of terminology, specificity, and cultural, political and religious differences between the U.S.A and Israel. There are numerous examples in the text. While the paper focuses on Hebrew subject heading problems, the problems are problems that are of general interest to those using LCSH in countries other than the United States.

National Activities in Classification and Indexing as Reported at IFLA

It is customary for the IFLA Standing Committee on Classification and Indexing to hear reports on classification and indexing activities of its member countries at its meetings during annual conferences. Representatives of 10 countries provided lengthy reports at the Jerusalem Conference in August 2000. These reports are too long to be covered in detail here but they are set out in the Section’s “Newsletter” published in November 2000. A few of the highlights are mentioned here.

With respect to the Dewey Decimal Classification (DDC), several developments have been taking place in France including the revision of the Area Table for France (T2 –44) and a CD-ROM of the DDC in French to be available at the end of the year 2000. DDC is being used in the French national bibliography and a mapping process between DDC and RAMEAU the French subject headings is planned. Similarly Sweden has been engaged in updating its concordance between DDC and the Swedish classification, Klassifikationssystem för svenska bibliotek (SAB). Also, a Norwegian abridged edition based on DDC21 has been produced recently. DDC is the dominant classification scheme in both academic and public libraries in Sri Lanka, with UDC being favoured in special libraries. Also in Sri Lanka there is interest in producing a phoenix schedule for Religion in order to deal with problems of Christian bias. The new UDC Class 2 (Religion) is regarded as being helpful in this possible revision.

Numerous activities are also related to the use of UDC. In Estonia, the major work of the 1990s was the preparation of a translation of UDC, which was published in January 2000. Based on the MRF of the English edition, various adaptations were made to accommodate the needs of Estonian libraries. Some unnecessary classes were omitted and additions were made in such areas as common auxiliaries of place, language and literature, and geography and history. Several events have been held to present the new edition to Estonian librarians. In Spain emphasis has been given to disseminating information and instruction on the use of classification. – Techniques and use of UDC (Universal Decimal Classification, by Carmen Diez Carrera and Theory and practice in Universal Decimal Classification (UDC), by Luis Miguel Moreno Fernández and Maria Delores Borgonos Martinez.

UDC is highly used in Spanish libraries of all types. The latest Spanish translation is the 7th published in 1995 and there are some problems to be solved. The development of a Spanish classification format is urgently needed. Finally, in the United Kingdom discussions are taking place with those involved in the MIRACLE project, a database of digital music for the blind, which is arranged by UDC These discussions may lead to the development of a concordance between LCC, UDC and DDC for music. In addition there are a goodly number of projects dealing with subject headings, thesauri and related types of indexing languages.

The Bliss Bibliographic Classification

The Bliss Classification Association reports annually on its activities and programmes in The Bliss Bibliographic Classification, second edition (BC2) in The Bliss Classification Bulletin. Number 4 of the bulletin was published in late 2000. In this issue the editor,
Tony Curwen reports on the progress of revision as follows. In November 1999, Classes AY (Science and Technology (General)) and Class B (Physics) were published. These classes were considered by the Editor, Jack Mills and his colleagues to be among the most difficult areas to revise. From there the work moved on to Class C (Chemistry). This Class was expected to be sent to the publishers by the autumn of 2000. Class I (Psychology and Psychiatry) is out-of-print and is suggested for revision. A draft schedule of Class LA (Archaeology) has been prepared for use at Cambridge. Other areas to be worked on in the near future include the Earth and Life Sciences. The Technology classes have been awaiting the completion of Physics and Chemistry and there are a number of fundamental questions to be answered as a basis for the development of History and The Arts. The editor also reported that Classes E-G (Biological Sciences) should not be too difficult to complete. Drafts of DA-DG (Astronomy), DH-DZ (Earth Sciences) are already in use at Cambridge and the editor hoped for publication of classes D-G following Class W in late 2000. Progress is being made on Classes U-V (Technology). Ultimately it will be necessary to return to classes published earlier – namely Religion, Psychology and the Health Sciences as they are now becoming out of date.

Classification Research Group

The CRG continues to take an active role in the discussion of classification and in the development of classification systems. The group held its 326th meeting in November 2000 and it continues to focus on the development of BC2. Most recently they have been concerned with drafts of Classes U/V (Technology). In its November 2000 meeting the discussion focused on the broader issues of classification. Briefly, the Group discussed the background and history of the CRG and considered the "Current status of classification". Among their concerns is the fact that “the IT revolution has revealed a general ignorance of classification principles and has concentrated system development on retrieving words rather than concepts”. Also many library and information science schools “now neglect this core element of library professionalism”. Thus they see a need to promote classification. Looking to the future, the Group considers the completion of BC2 must continue to have high priority. Future publication arrangements have been uncertain with changes at Bowker Saur. However, this problem may be solved by the fact that Bowker (BC2’s previous publisher) has recently sold its book list to K.G. Saur in Munich. At the 326th meeting the Group set out aims and objectives that would focus on future work. As stated the overall objective would be “to develop and promote the practice and principles enabling retrieval by subject from stored information”. To achieve the objective specific aims were suggested. These were the completion of the publication of the 25 volumes of BC2, the dissemination of information about classification, encouragement of wider adoption of BC2, encouragement of

- research and software development to support the application of classification,
- development of an abridged BC2 appropriate to school libraries, and promotion of the
- principles for developing a thesaurus from the basis of a classification scheme.

This volume contains the full text of 62 papers presented by scholars hailing from several countries at the 6th International Conference of the International Society for Knowledge Organization (ISKO). The overall theme of the 2000 Conference was Dynamism and Stability in Knowledge Organization; it was further subdivided into eight key issues which the speakers had been asked to address. As we shall see, most papers did indeed explore the dialectics of the relationship between dynamism and stability, pointing out ways of dealing with it, to better develop our research and practices.

Conference papers are grouped, as they were at the Conference, on the basis of the key issue that they addressed.

I. “Theories of Knowledge and Knowledge Organization.”

Members of the panel which addressed theoretical issues explored one or more of three tendencies in knowledge organization theory. These tendencies are: a. the criticism of the classificatory principles underlying the theory, and arguments towards a new epistemology for knowledge organization based on pragmatism [Jacob (p. 16-22), Mai (p. 23-27)]; b. a revision of the main characteristics of classificatory principles such as mutual exclusivity, teleology and hierarchy [Olson (p. 3-9)], presenting alternative principles to give an account of the diversity of knowledge contributions. Breitenstein (p. 10-15) relates classification, cultural studies and individual experience as instances of knowledge discovery which, if observed in their dialectic relationship, could lead to a better understanding of the demands for stability and dynamism inside classification theory; c. claims for an actualization of the faceted classification. Neelameghan (p. 164-169) discusses the ability of the analytic-synthetic methodology to cope with a sum of knowledge increasing in quantity and diversity, as well as its capability to fit into the digital environment. La Barre (p. 157-163) argues for a re-examination of the success and failures of traditional faceted schemes, in search of solutions for today’s knowledge organization problems. Priss (p. 170-175) proposes facet analysis as a methodological principle to evaluate classification schemes. Fallis and Mathiesen (p. 339-344) focus on consistency. Campbell (p. 345-351) talks about the use of classification systems in electronic environments, and claims the necessity of revisions, stressing that the design, structure, and manipulation of print documents are quite different from those of electronic ones.

II. “Culture, Language, and Communication in Knowledge Organization.”

A few papers in this panel are concerned with the integration of diverse cultures through the implementation of means for knowledge transfer between east and west [Arsenault (p. 143-149), Shaoye (p. 150-156)]. Others focus on various methodologies for the improvement of knowledge organization, particularly on the Web. Ying and others (p. 28-34) present a methodology for keywords clustering in the Web. Hudon (p. 35-40) examines knowledge organization schemes used to organize the so-called virtual libraries on the Web, suggesting that more elaborate and theoretically-based thematic access to virtual libraries may in fact be more user-friendly than the supposedly intuitive structures. Clarke (p. 41-47) deals with knowledge organization in Intranets, presenting a methodology for automatic categorization of search results. Solomon (p. 254-260) argues that we must explore the “knowing” process, before establishing a definitive theory of knowledge organization. Solomon also stresses the necessity of being
aware of the actors and of the ecologies involved in the process of knowing. McIlwaine (p. 261-267) examines the impacts of interdisciplinarity on information retrieval in the Web, and explains how UDC is coping with problems.

III. “New Information Technologies for Knowledge Organization.”

All papers in this stream touch on one or more aspects of the relationship between information technology and knowledge organization. Buckland and others (p. 48-54) argue that there is a considerable difference between discipline and sub-domain vocabularies, stressing that both are important for retrieval. While the sub-domain vocabulary is the interface vocabulary for query formulation, the discipline vocabulary, arranged according to Library of Congress Classification (LCC) numbers will function as an instrument for search results presentation. Moya-Anegón and López-Huertas (p. 55-63) present a method for automatic updating of bibliographical classifications. Hocine and others (p. 64-70) introduce an approach in which the Web interrogation process is based on the logical and semantic structures of documents. Saggion and Lapalme (p. 176-181) focus on the automatic generation of summaries. Van der Walt (p. 182-188) shows the results of his survey of South African Web directories, portals and search engines. García and others (p. 189-192), Davenport and Rosenbaum (p. 352-358), and Polanco and François (p. 359-365) are all concerned with organizing knowledge for institutional use. While the first authors focus on interface design, the second concentrate on a classificatory framework based on activities. Polanco and François introduce a text mining approach whose objective is to facilitate the process of knowledge analysis through text cluster mapping. Jurisica (p. 366-371) deals with knowledge organization in scientific domains, presenting a method for knowledge systematization through case-based reasoning for situations where theory is lacking.

IV. “Cognitive and Linguistic Foundations.”

Here are presented essays and results of experiments exploring linguistic and cognitive options for knowledge organization. Bowker (p. 71-76) focuses on medical terminology, investigating the motivations behind the choice of a term, as well as the trend to standardize multiple discourses in only one form of expression. Qin (p. 77-82) presents a study about knowledge structure detection through co-word analysis in scientific literature. Schmitz-Esser (p. 83-89) is concerned with the systematization of ontologies in multilingual contexts; Green (p. 193-199) reports on her research on clustering by means of a frame for the establishment of semantic relationships. Frâncu (p. 200-205) presents the results of a project designed to develop an interdisciplinary and multilingual thesaurus based on the UDC logical structure. Broughton (p. 206-212) examines the mathematical nature of term relationships. Smiraglia (p. 295-300) argues that a work is not a thing to be described by its intrinsic properties only, but also in relation to the knowledge domain to which it contributes. Bean (p. 301-304) discusses cognitive processes in users who establish hierarchical relationships among terms. Christensen (p. 306-312) argues that anthropological as well as sociological conditions around text production can help to clarify some aspects of the relationship between knowledge organization and knowledge production. Beghtol (p. 313-319) claims the necessity of identifying culture-based as well as culture-independent concepts and cognitive processes. Culture-independent concepts are the universals that could be used as foundation elements in classification systems for any culture or domain.


The following papers provide different visions of systems and their organization. Yu (p. 90-96) presents a history of knowledge organization techniques following the introduction of information technology. According to him, there are four generations of techniques: the first centers on the entity, the system itself; the second centers on the object, the information; the third one is goal-supportive; the fourth one is concerned with the agent, incorporating a social dimension. Peetersen and Albrechtsen (p. 97-110) describe an approach to classification systems designed for knowledge sharing among actors with diverse expertise and professional backgrounds within and across organizations. Kent (p. 111-117) shows how the observation of the information flow among diverse communities of discourse can provide the basis for knowledge organization through ontologies. Bartolo and Trimble (p. 118-123) investigate the relationship between author assigned keywords and classification systems in order to improve retrieval. El Hadi (p. 124-130) speaks of linguistic techniques, such as machine translation and natural language processing, and of their role in cross-lingual information retrieval on the Web. Riesthuis (p. 131-135) expresses his concern with multilingual subject access and the failure of thesauri to deal with all the difficulties of multilingual retrieval. Carlyle and Summerlin (p. 320-326) describe a procedure for the visualization of search results for works of fiction, in which the
work itself as well as others produced about it are clustered automatically. Ihadjadene and others (p. 327-332) describe an experiment in which the categories of the Dewey Decimal Classification (DDC) are used to assist the users in filtering their search results. Hudon and others (p. 333-338) report on a study of the vocabularies used to organize moving images collections, with a view to designing a uniform vocabulary which could increase the efficiency of resource sharing.

VI. “Information Policies and Management of Knowledge Structures.”

Three papers speculate on what lies behind knowledge organization choices. Craig (p. 213-218) analyses the British Treasury’s Registry procedures between the two world wars. Huber and Gillaspy (p. 219-223), through an examination of medical vocabularies, classificatory structures and specialized information resources, try to define, analyze and document the relationship between the delivery of health care for homosexuals and knowledge organization in this area. Cardoso and others (p. 224-230) examine the applicability of contemporary theories of knowledge to study information in organizations.

VII. “Global Users and Uses of Knowledge and Knowledge Organization.”

Ohly (p. 231-236) describes a bibliometric analysis of a knowledge field. Hildreth (p. 237-246) reports on his study of the retrieval performance of OPACs. Sigel (p. 247-253) argues for a user-based indexing procedure, in which user groups and their activities must be considered.

VIII. “Knowledge Organization of Universal and Special Systems.”

The common characteristic shared by all papers in this stream is their focus on the adaptation of traditional knowledge organization tools to the new requirements of a digital environment. Williamson (p. 268-274) points out changes in databases in terms of information growth as well as technological innovations and the consequent implications of those for thesaurus design and development. Rademaker (p. 275-281) provides a description of the classification of ornamental designs in the US Patent Classification System. Mitchell and Vizine-Goetz (p. 282-287) describe the development of a Web-accessible server based on the DDC. Pollitt and Tinker (p. 288-294) introduce a methodology to deconstruct DDC class numbers so that they can be used in view-based OPAC searching. Kwasnik and Xiaoyong (p. 372-377), using the example of eBay.com, demonstrate the usefulness of a classification scheme in commercial Web-sites. Devadason and Wongjariya (p. 378-384) describe a prototype of facetico-hierarchical object system having as its goal to provide organized access to networked resources. Ardö and others (p. 385-390) compare a universal with a special classification system as tools for browsing on the Web. Howarth (p. 391-397) reports on the development of an ontology for enhancing resource discovery in knowledge bases.

After a careful reading of all the papers, this reviewer, who unfortunately could not participate in the conference, feels that all the authors addressed the issues surrounding dynamism and stability in knowledge organization in a very interesting fashion, proposing creative and intelligent solutions as well as wealthy theoretical discussions. This book of proceedings is indeed worth reading to learn what has already been done, what we can expect to be done, and what should be done, in the field of knowledge organization.

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The book contains a foreword by the Calouste Gulbenkian Foundation, a list of the Members of the Commission, and four chapters.

Chapter I. “The Historical Construction of the Social Sciences, from the Eighteenth Century to 1945.”

According to the authors, the existing disciplines of the social sciences appeared between 1850-1914, when the structure received formal recognition in universities. There were five main locales for social science activity during the 19th century: Great Britain, France, the Germanies, Italy, and the United States. Before that period, the great authors in the social sciences were not either economists, sociologists, political scientists, geographers, historians, etc., but many or all of those simultaneously. There existed a certain amount of specialization, but not the established division into different disciplines as we know it today.
The need for a real social science emerged when universities expanded and became centres for the production of knowledge, during the 19th century (p. 12).

Around 1850, a very broad range of social scientific "subjects" or "disciplines", as many as 250, co-existed. These were reduced to the limited number that we know today before the First World War, each discipline defining its object of study and refining its own research methods. According to Wallerstein, the following subjects were established as modern disciplines during that time, and in this order:

**History** studied the past in an idiographical way, whereas economy, sociology and political science sought general laws within the modern society (nomothetical science). Because of its idiographical and antitheoretical attitude, history is now, however, often seen as belonging to the humanities rather than to the social sciences.

**Economics** was studied with politics as "political economy", prior to becoming a "pure" field of knowledge and research. By removing the qualifier, the economists could claim that economic behaviour reflected a universal, individualistic psychology, rather than socially constructed institutions (p. 56). The separation between economics and politics, would allow for the development of a new discipline, political science.

**Sociology** developed as a discipline in the second half of the 19th century, out of the institutionalization and transformation within the universities of the work of social reform organizations, whose agenda had been to deal with the discontents and disorders of the much-enlarged urban working-class populations. Sociology has always retained its concern with ordinary people, and with the social consequences of modernity. Partly in order to consummate the break with its origin in social reform organizations, sociologists began to cultivate a positivist thrust which, when combined with their interest in the present, pushed them as well into the nomothetic camp.

**Political science** as a discipline emerged later, not because its subject matter, the contemporary state and its politics, was less amenable to nomothetic analysis, but primarily because of the resistance of law faculties having to yield their monopoly in this area. This resistance may explain the importance given by political scientists to the study of political philosophy, sometimes referred to as political theory, at least until the so-called behaviorist revolution of the post-1945 period. Political philosophy allowed the new discipline of political science to claim a heritage that went back to the Greeks and to read authors that had long had a place in university curricula.

**Anthropology** (and Oriental Studies) became the only non eurocentric discipline. It studied foreign, non modern cultures ("tribes"). To do so, it developed methods like field studies and participant observations.

The following disciplines were not considered social sciences:

**Law** was considered as primarily normative in its interpretation of the meaning of texts, and as more of a professional than a scientific field.

**Geography** (cultural) was not institutionalized as a social science; this may be regarded as a symptom of the neglect of the spatial aspect of the social sciences.

**Psychology** remained connected to medicine. The field of social psychology was, however, established as a sub-discipline within sociology.

The first chapter concludes:

Thus, between 1850 and 1945, a series of disciplines came to be defined as constituting an area of knowledge to which the name “social science” was given. This was done by establishing in the principal universities first chairs, then departments offering courses leading to degrees in the discipline. The institutionalization of training was accompanied by the institutionalization of research [through] the creation of journals specialized in each of the disciplines; the construction of associations of scholars along disciplinary lines (first national, then international), the creation of library collections catalogued by disciplines. (p. 30)

This chapter provides a fine rationale that explains much of how and why the social sciences emerged and were structured the way they are. Unfortunately, there is almost no documentation in this chapter, or in the book as a whole for that matter. The reader may want to know, for example, what the 250 disciplines in existence around 1850 were (and the source of this information). The description of the structure in universities is very general without any documentation or references. This makes it impossible to validate the information and to base the development of a classification of the social sciences on empirical data.

Chapter II. “Debates Within the Social Sciences, 1945 to the Present.”

After the Second World War, however, at the very moment when the institutional structures of the social sciences seemed for the first time fully in place and
clearly delineated, the practices of social scientists began to change. This was to create a gap, one that would grow, between practices and intellectual positions of social scientists on the one side and the formal organization of the social sciences on the other. (p. 32)

There seems to be three main causes behind this change:

1. The validity of the distinctions among the social sciences.

According to Wallerstein, there existed three clear lines of cleavage in the system of disciplines erected to structure the social sciences in the late 19th century:

1. The line between the study of the modern or civilized world (history, plus the three nomothetic social sciences), and the study of the non modern world (anthropology, plus oriental studies).
2. Within the modern world, the line between the past (history) and the present (the nomothetic social sciences).
3. Within the nomothetic social sciences, the sharp lines between the study of the market (economics), of the state (political science), and of the society at large (sociology).

Each of these lines of cleavage came to be challenged in the post-1945 world.

Disciplines which had concentrated until then on the western world began to show an interest in non-western societies. This undermined the logic justifying the existence of separate disciplines like ethnography and oriental studies. It also led to doubts among the nomothetic social sciences about whether the generalizations (laws) they had found were also valid for the non western areas. This caused a questioning of the distinction between nomothetic and idiographical disciplines, and with it the incorporation of historical methods in economics, political science, and sociology, as well as a change in the discipline of history from collecting facts towards the mapping of underlying institutions, ideas, etc. Economics, political science, and sociology remained three separate disciplines, but a greater overlap in both subject matter and methodology developed.

One way to deal with this new situation was to invent “interdisciplinary” designations such as communication studies, management, and behavioural science. Thus, one of the most significant innovations after 1945 was the creation of multidisciplinary “area studies” as a new institutional category. Whereas the range of field denominations in the social sciences had declined in the period 1850-1945, the tendency since 1945 has been an increasing number of fields. Many new denominations come to existence in research programs, institutions, journals, and in new categories in the libraries.

2. The degree to which the heritage is parochial.

This part of the chapter discusses the question of whether the claim of the nomothetical social sciences on universal validity is justified or whether this is a kind of eurocentrism. Is the one-sided social recruitment of teachers and students to the universities influencing their opinions? And do the arguments from feminist researchers as well as from other groups constitute an attack on universalism? Wallerstein finds that the social sciences have been deaf to the justified criticisms raised against their narrow-mindedness. Towards the end of the 1960’s, these arguments began to be more influential.

3. The reality and validity of the distinction between the “Two Cultures”.

The social sciences had earlier been split between two cultures: that of the humanities and that of natural sciences. Many dividing lines are beginning to be demolished, and the view of science, for example, has changed dramatically.

Chapter II thus offers strong arguments for a discussion of why the existing social science classification structure is problematic. Wallerstein’s treatment is very general both in the discussion of single disciplines and in selection of disciplines. Sources such as Social Science Citation Index and International Encyclopedia of the Social Sciences list many disciplines that are not covered by Wallerstein. A more comprehensive listing of social scientific disciplines should in my opinion include the following: anthropology; economics; educational research; futurology; geography & area studies; history; law studies; library and information science; linguistics; media- and communication studies; organization, management & business studies; philosophy & science studies; political science; psychology; sociology; statistics; women’s studies (and sex studies); other social sciences, including interdisciplinary studies of religion, criminology, youth and gerontology. The internal relations between these fields are not entirely defined, and one may ask whether as a group they really belong to “the Social Sciences”. The fact that they are sometimes considered social sciences must, however, be considered in any serious discussion of the organization of the social sciences.
Chapter III. “What Kind of Social Science Shall We Now Build?”

The third chapter discusses four major issues: 1. Humans and Nature; 2. The State as an Analytic Building Block; 3. The Universal and the Particular; and 4. Objectivity. Because of space limitations, these issues cannot be presented or discussed in this review. It can only be said that any universalism must reflect historical circumstances and power relations, but that some kind of objective ideals should guide social scientists.

Chapter IV. “Restructuring the Social Sciences.”

The authors admit that there is no simple, clear cut formula for reorganizing the social sciences, and their proposals are in my view unsatisfactory for those who work in the field of classification research and knowledge organization. Although the idea of an internal division of labour in the social sciences remains, the recommendations go more in the direction of strengthening the interdisciplinary work than in discussing the principles on which the disciplines can be identified and separated.

My own view is that classificatory principles always reflect (consciously or unconsciously) the theoretical and philosophical approach of the field being classified. A positivist view of the social sciences thus tends to favour a nomothetical approach which again – as Wallerstein has so brilliantly demonstrated – has a strong impact on which these sciences structure themselves. A given structure is thus a reflection of the relative influence of different philosophies. To the degree that my view is correct, the first job for us in KO is to identify the most important underlying theoretical influences, for example: Empiricism/Positivism; Rationalism; Historicism/Hermeneutics/Phenomenology; Pragmatism/Functionalism/ Marxism/Feminism; Eklecticism, Postmodernism, Poststructuralism. Each of these approaches implies its own consequences and principles for the classification of the social sciences. If we want to contribute to the classification of the social sciences, we must engage in these questions (see also Hjørland, 1998). This may not be an easy job. But what are the alternatives? Are there any other proposals?

Reference


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The Sears List of Subject Headings, with close to eight decades of progressive history behind it, is by now a very familiar tool in the small libraries where it is used for subject cataloguing. Its regular editions and its will to keep itself up to date, supported by a well-oiled revision machinery, have kept the Sears List efficient and popular.

This is the third consecutive edition under the editorship of Dr. Joseph Miller who succeeded Martha Mooney in 1992. Under Dr. Miller’s stewardship, the Sears List has gone through spectacular changes. These are namely the reformulation of headings in direct rather than inverted order, the introduction of a thesaurus format, and now the merger of the lists of commonly used subdivisions. In the current edition, the policy changes and technical improvements initiated in the previous two editions have come full circle.

The new edition brings in additions, deletions, modifications and replacements on account of: a) Advances in information science; b) Change in library users’ behaviour; c) Emergence of new subjects; d) Linguistic and terminological changes in names of subjects as reflected in current literature. The revision of this list, as usual, was based on users’ suggestions from libraries, commercial/cooperative bibliographic services, and from staff indexers at the H.W. Wilson Company. In accordance with an age old policy, the Library of Congress Subject Headings (LCSH) were also consulted.

In the 17th edition, some basic changes have been introduced. The Editor’s Introduction, in reality a concise users’ manual, has been recast. For the first time, the Introduction is divided into numbered sections, and illustrated with examples; it is clear and simple to read, and easy to refer to. We feel, however, that a brief index to the preface and to the Editor’s Introduction would have been useful.

As a major and striking change in structure, the mixed list of commonly used subdivisions appended in the front matter of Sears 16 (published in 1997) has been dropped and integrated to the main list. Historically speaking, this list was first made available in the 3rd edition (1933). The separate list had already been made redundant in the 16th edition, when each of the “commonly used” subdivisions was shown as an access point in the alphabetical list of headings. The main list provided ample room for copious scope notes and instructions on the application of each of such subdivisions. Every subdivision now has a general reference with
specific instructions on its mode and areas of application. For the 17th edition it was boldly decided to abrogate the entire separate list of 1 200 subdivisions in favour of a much more extensive treatment in the main body of the list. The editors now perceive, and rightly so, that it is arbitrary to designate some divisions as commonly used. Except for a few form subdivisions, they are not free-floating either. In fact, over the years the commonly used subdivisions have steadily grown into a mixed mass of topical, aspect and bibliographic form subdivisions; out of these, only bibliographical forms could be really called commonly used subdivisions per se.

The merger of subdivisions with main headings has no consequence for the public catalogue nor for the subject authority file. But when teaching the theory and application of the Sears List, a new look at them will be required. Students of the Sears List are always taught subject analysis in terms of broad categories of concept/topic – Topical subdivision – Form subdivision. This is in accordance with S. R. Ranganathan’s famous PMEST formula.

For the first time, the Sears List prescribes a citation order when two or more subdivisions are used simultaneously. This order is: Main heading – Topical subdivision – Geographical subdivision – Chronological subdivision – Form subdivision. This is in accordance with S. R. Ranganathan’s famous PMEST formula.

The subdivisions are of four kinds:

a) Topical subdivisions. These represent aspects of a given subject that are somewhat, though not absolutely, specific to a given heading. For example: Blood – Transfusion, Railroads – Signaling, Food – Cholesterol contents.

b) Form subdivisions. These represent the form of presentation of a subject. Form subdivisions are mostly universal, and can still be called commonly used subdivisions. For example: Economics – Encyclopaedia, Sports – Fiction, Ohio – Bibliography. Newly added subdivisions in this category include: Biblical teaching; Memorising; Interactive multimedia; Press coverage; Juvenile drama; Storage; Tournaments.

c) Geographic subdivisions. These are the subdivisions of a (subject) heading by place. Their application is restricted and must be prescribed (may subdiv. geogr). In this edition many such instructions have been added. As was the case before, geographic names may also form headings instead of subdivisions. When a geographical place is a heading it may be divided by topical, form, and chronological subdivisions.

d) Chronological subdivisions are used mostly with history related headings.

Some headings can also be used as subdivisions. In fact, the distinction between permanent/real subdivisions and subject headings proper is not an easy one to make, and it gets increasingly blurred with the growing complexities in information packaging and multidisciplinary growth. Scope notes are given at appropriate places to distinguish between topic and form.

Many of the newly added headings are quite clearly in the realm of IT: Cyberspace; Databases; Electronic discussion groups; Technological literacy. Other significant additions are: Achievement tests; Crisis intervention (Mental health services); Feng-Shui; Grandparents as parents; Land mines; Postcolonialism; Stalking; Violence in mass media.

Numerous headings have been revised, especially in the areas of world history millennium/century change studies. The dawn of a new century and the media hype surrounding it have led to many changes around the concepts of “modern” and “century”. The heading Modern history – 1800-1899 (19th century), for example, is now simply Nineteenth century.

Indians of North America is now Native Americans: this is considered a most significant change. The new heading replaces two headings of Sears 16, namely, Indians, and Indians of North America. Twenty-seven topical subdivisions are listed under Native Americans, and this reflects a new interest in studies of Aboriginal Americans. Consequently, a hoard of other changes in headings and/or subdivisions had to be effected. For example, Indians of North America – Art became Native Americans – Art, and Indians of North America – Dwellings is now Native Americans – Dwellings. There are at least 40 such alterations. Cultural headings in this category have been changed to phrasal headings; for example, Indians of North America – Names has become Native American Names. The headings representing Aboriginal peoples from other regions have also been changed; for example, Indians of South America – Peru is now Native Americans – Peru. As a corollary, all headings including the adjective American have been changed to geographically subdivided topical headings; for example, American actors is now Actors – United States, and American ethics is Ethics – United States.

Headings representing material stationary objects are not given national adjectives, but rather subdivided geographically; for example, Architecture – France. But when the objects can be transported or replicated, they can be modified by a national adjective; for example,
German automobiles – India, French architecture – Morocco.

Headings that may be created by the cataloguer have been divided into three explicit categories: a) Subject names; b) Geographical names; c) Personal and corporate names, and uniform titles. This list (found on page xxxix) is less enumerative and more suggestive than the one in Sears 16. There are still seven key (model) headings, with Native Americans included under the new key heading Ethnic groups.

There are many other minor changes. Classification – Books has at last been replaced by Library classification. In the all pervasive electronic age, Electronic data processing has become simply Data processing. Singular and plural forms are sometimes used instead of parenthetical qualifiers to distinguish homographs; Lime (fruit) has become Limes, and Lime (mineral) is now Lime. There are about 230 such modified headings.

The number of headings and subdivisions is slightly higher than in the previous edition. The 17th edition contains: 7360 Subject headings, 320 Reference records, 60 Corporate names, 53 Personal names, 40 Uniform titles. The 320 reference records provide instructions for the application of subdivisions that are not themselves subject headings, for example, History and criticism and Environmental aspects. When a subdivision is the same as a heading, as is the case with Management or History, a general reference is given under the main heading stating the distinction between its dual applications.

On every page, space has been saved by eliminating those references which were no longer useful. Space was also saved by deleting the redundant footnotes spelling out the full form of thesaurus symbols such as BT, RT, SA etc. These are now given once and for all on page xlii. Unfortunately, there is not enough room in the margins to record local decisions and locally created headings.

The 17th edition is based on the three primary principles of specific and direct entry, uniformity, and consistency. But in this edition, more emphasis has been placed on specific and direct entry, a sacred principle of subject cataloguing which has no alternative.

There are some minor errors of omission and commission in an otherwise thoughtfully edited and professionally prepared edition. The heading Subject catalogs is there, and so is Subject headings, but Subject cataloguing is not represented. Under the heading Tropics, a reference is made to the corresponding subdivision Tropical conditions; Tropical conditions itself, however, is nowhere to be seen in the main list. An associative relationship could have been created between Alphabets and Calligraphy, as both refer to the same class number 745.6. On page x (Preface), Environmental policy appears as Environ-mental policy. On page xl, under Facsimiles, a SEE reference remains (it should be a USE reference of course).

The terminology in the Preface and in the Editor’s Introduction may appear vague not only among its users but also among the experts. A glossary of standardized terms would clarify and standardize, and would be a welcome addition to the next edition.

Overall, this is a progressive edition reflecting current thoughts in information science and subject cataloguing. Though out and out American in terminology and subjects represented, it can still be useful outside of the United States. The popularity of the Sears List of Subject Headings will continue to lie in its responsiveness to user needs and to technical advances in information science.

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Knowledge Organization Literature
Gerhard Riesthuis: Literature Editor

0 Form Divisions
02 Literature reviews
See 0458, 0459, 0477, 0478, 0504, 0506, 0531, 0605, 0618

06 Conference Reports and Proceedings
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07 Textbooks


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35 Manual and Automatic Ordering Techniques

See also 0476, 0489, 0575, 0619


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41 On Universal Classification Systems and Thesauri in general


42 On the Universal Decimal Classification


43 On the Dewey Decimal Classification

See also 0458


44 On the Library of Congress Classification and Library of Congress Subject Headings


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61 On Classifications & Thesauri in Form and Structure Area


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66 On Classifications & Thesauri in Socio-Area

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<thead>
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<th>Title</th>
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</tr>
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<td></td>
<td>5759-92</td>
<td></td>
</tr>
</tbody>
</table>
78 Subject-oriented Terminology Work

0558

0559

79 Multilingual Systems and Translation

0560

0561

8 Applied Classing and Indexing

81 General Problems

See also 0598

0562

84 Classing and Indexing of Primary Literature

0563

85 Back-of-the-Book Indexing

0564

86 Classing and Indexing of Secondary Literature

0565

0566


**9 Knowledge Organization Environment**

**91 Professional and organizational Problems in General**

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0597 945

0598 945; 811

946 Bibliographic Description. Formal Cataloguing

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0600 946

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0602 946
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0605 946; 02

0606 946; 752

0607 946; 752

0608 946; 879

947 Interface and Displays for Bibliographic or Archival Records

0609 947; 918

949 Authority control

0610 949

95 Education and Training in Knowledge Organization

See 0596

98 User Studies

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0611 981
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Personal Author Index

Ahrweiler, P. 0532
Arms, W.Y. 0495
Arnadottir, A.S. 0520
Asmus, S. 0476
Bador, P. 0480, 0481
Baker, T. 0580
Bakewell, K.G.B. 0564
Bakonyi, G. 0526
Balikova, M. 0598
Banerjee, K. 0543
Barite, M.G. 0469
Barrett, H. 0610
Beagle, D. 0609
Beeking, M. 0542
Behman, F. 0613
Bertrand-Gastaldy, S. 0494
Boll, J.J. 0461
Brandt, D.S. 0544
Broughton, V. 0505
Bruggemann-Klein, A. 0533
Budin, G. 0465
Bugental, J.O. 0616
Burton, P.F. 0551
Campbell, D. 0549
Caplan, P. 0495
Carrascosa, C. 0527
Chen, H. 0523
Crawford, W. 0599
Currano, J. 0553
Czap, H. 0473
David, A.A. 0535
Deckelbaum, D. 0588
Dhyani, P. 0502
Dobratz, S. 0500
Dovey, M. 0583
Eakins, J.P. 0572
El-Korany, A. 0521
Endres-Niggemeyer, B. 0529
Farrow, J. 0462
Feicheng, M. 0565, 0566
Feldman, S. 0547
Fitches, J. 0513
Fraenkel, A.S. 0541
Freeborn, R.B. 0624
French, J.C. 0539
Frost, C. 0569
Gajewski, T. 0508
Gauloikova, I. 0530
Germani, I. 0594
Gestdottir, A. 0576
Gilstrap, D.L. 0501
Glauser, C. 0470, 0471
Goppold, A. 0579
Gould, S. 0591
Goz, A. 0608
Grange, D. 0593
Green, P.E. 0492
Green, R. 0588
Grössler, A. 0474
Grossman, D.A. 0460
Guarino, N. 0485
Guerrini, M. 0601
Güler, E.C. 0493
Haifeng, W. 0560
Hellweg, H. 0575
Hepworth, M. 0554
Hochstenbach, P. 0496
Hochstenbach, P. 0497, 0498
Horsman, P. 0510
Hunter, J. 0603
Husch, L. 0552
Jackson, J. 0501
Janecke, P. 0467
Jenkins, J. 0483
Jiancho, X. 0509
Johannsdottir, A. 0581
Jolibois, S. 0514
Julian, V. 0527
Juliusdottir, S. 0590
Karlsdottir, G. 0503
Kita, K. 0500
Klein, H. 0490
Klein, R. 0533
Klein, S.T. 0541
Klement, T. 0528
Krieger, A.M. 0492
Landgraf, B. 0583
Le Ray, S. 0556
Lederbogen, U. 0611
Lee, K.H. 0524
Lehner, C. 0466
Leidig, T. 0517
Leighton, H.V. 0545
Leininger, K. 0562
Lenart, M. 0592
Lenski, W. 0487, 0457
Lindquist, M.G. 0602
Lu, Q. 0524
Mackie, M. 0551
Mai, J.E. 0588
Maly, K. 0540
Maniez, J. 0586
Mann, T. 0507
Marchand, P. 0494
Masolo, C. 0485
Mayer, M. 0619
Mellwaine, I.C. 0588
McMahon, J. 0522
Meder, N. 0515
Miller, P. 0536
Minamoto, S. 0573
Morgan, E.L. 0534
Morgan, E.L. 0538
Murakami, Y. 0600
Mustafa el-Hadi, W. 0586
Näcke, L. 0479
Nelson, M.L. 0540
Neuhof, M.D. 0482
Ng, E.H. 0499
Ng, M.K.M. 0524
Oard, D. 0561
Ohly, H.P. 0457, 0461
Oppehenheim, C. 0531
O’Reilly, C. 0571
Orthmann, C. 0479
Pathak, L.P. 0468
Peereboom, M. 0550
Plutat, B. 0511
Rahmstorf, G. 0457, 0464
Rambler, M. 0519
Ramsey, M.C. 0574
Redeker, G. 0584
Reuther, A. 0474
Rey, J. 0480, 0481
Ridley, M. 0537
Rovig, M.E. 0568
Rosenbaum, H. 0548
Rosenbaum, S. 0616
Roulier, J.F. 0567
Rowley, J. 0462
Rui, C. 0493
Satija, M.P. 0478, 0504, 0506
Satyanarayana, N.R. 0488
Savoca, M. 0594
Schmid-Esser, W. 0484
Schott, H. 0518
Schulz, M. 0500
Schulz, U. 0512
Scibor, E. 0477
Shaw, W. 0615
Sigel, A. 0457, 0486
Singh, R. 0606
Singh, S. 0607
Smith, F.J. 0522
Snyder, H. 0548
Soler, J. 0527
Spinler, H.F. 0463
Srivastava, J. 0545
St Pierre, M. 0475
Stegbauer, C. 0612
Stephan, P.F. 0476
Stoklasova, B. 0598
Stone, J. 0559
Strunk, K. 0596
Swertz, C. 0516
Tedd, L.A. 0459
Teubener, K. 0617
Tinker, A.J. 0525
Tranchida, R. 0557
Trebbe, J. 0611
Trelaro, A. 0618
Turner, C.H. 0568
Turner, J.M. 0567
Umstätter, W. 0489
Vallejo, D.B. 0535
Van de Sompel, H. 0496, 0497, 0498
Van der Vet, P. 0528
Vetere, G. 0485
Viles, C.L. 0539
Vitale, S. 0594
Wang, J.Z. 0570
Warner, J. 0555
Weaver, M. 0589
Weibel, S. 0582
Welty, C.A. 0483
Wette-Roch, E. 0487
Wheeler, W.J. 0458
Willer, M. 0597
Williams, P.L. 0564
Wurm, J.P. 0595
Yoon, K. 0614
Yu, E. 0547
Zubair, M. 0540
Zurawski, N. 0617