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IN THEORY THERE IS NO SOLUTION: THE IMPEDIMENTS TO A SUBJECT CATALOGING CODE

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The following article recognizes that the American library profession needs a subject cataloging code in order to evaluate the effectiveness of the subject catalog, take advantage of online technology, and keep the subject headings list current by enabling non–Library of Congress catalogers to establish new headings as they are needed. However, the impediments to a code include not only practical problems, but also unresolved philosophical issues. We have no consensus on the major objectives of a subject catalog, we cannot define subject, specificity, or relevance, and we cannot explain the intellectual analysis that determines the subject heading for a cataloged work. The article concludes with some practical suggestions for improving the effectiveness of subject cataloging even without a theoretical code.

Charles Cutter first issued his *Rules for a Dictionary Catalog* [1] in 1876. Three more editions appeared through 1904. Although the *Rules* were never formally adopted by the Library of Congress, they are generally cited as the philosophical basis for Library of Congress subject cataloging.

In the absence of a formal code, Library of Congress practice became the accepted standard for subject cataloging in most American libraries. The Library of Congress (LC) established itself as the authority when it began selling printed cards in 1901; other libraries were quick to see the advantages of reduced local costs and national standardization and have accepted LC cataloging with little alteration ever since [2]. However, the classed catalog, which divided knowledge into major topics and listed the subject identified for each work as the last element in a hierarchical string of terms, was familiar to Library of Congress catalogers at the turn of the century, and it influenced some of the subject headings that were

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established at that time (for example, Wages—Minimum wage). The *Library of Congress Subject Headings* list we use today includes a variety of subject heading forms that reflect the philosophies that were in vogue when they were established [3, p. viii]. But these internal inconsistencies make it difficult to apply a system that is based on precedent and analogy rather than on formal rules. "If there is no obvious principle to guide the cataloger, it is plain that there will be no reason why the public should expect to find the entry under one heading rather than another" [1, p. 66].

A number of individuals have tried to create a subject cataloging code, but none of these proposed codes have supplanted Cutter's *Rules* in American librarianship. The closest we have come to a code is Haykin's *Subject Headings: A Practical Guide* [4] and the Library of Congress's *Subject Cataloging Manual: Subject Headings* [5].

Both the Haykin and Library of Congress manuals explain Library of Congress procedures and the policies that catalogers follow in specified situations. This is not, however, a code. A subject cataloging code would provide guidelines for subject catalogers to use in determining the subject or subjects of an item. The guidelines would enable others to evaluate the catalogers' decisions and would ensure that similar materials were given consistent treatment even if they were cataloged by different catalogers at different times. A code would also specify how to translate subject concepts into subject headings. Users could predict the subject heading form and increase the success rate of subject searches.

Without a code, catalogers outside the Library of Congress cannot establish new headings as they need them. Furthermore, librarians cannot evaluate the effectiveness of the subject catalog or design new cataloging procedures without stated objectives against which to measure present practices.

It may be possible to systematize subject headings, as the Library of Congress is trying to do. It would be much more difficult, however, to discern a coherent design underlying a system that is based on practices followed over nearly a century of varying philosophies. In addition, there are several practical impediments to the development of a code for Library of Congress subject cataloging.

Subject cataloging in the United States is the province of the Library of Congress Subject Cataloging Division. Many libraries treat copy cataloging as a paraprofessional task and would not welcome the time and cost necessary to involve professional staff members in ongoing subject authority control, even if the Library of Congress were willing to abdicate from or to share this role. "Subject headings systems require revision and review by full-time staff and do not lend themselves to maintenance by committee" [6]. In any case, as the library profession is

presently organized, it would be difficult to create an alternative authority agency.

The development of online catalogs may also be an impediment to a code. Online catalogs provide an opportunity for new types of access if we modify our practices to take advantage of them. Online catalogs can also mitigate some of the difficulties encountered when searching a system that includes a bewildering variety of terms, forms, and levels of subject headings. If the online catalogs make the present system more effective than it has been in manual catalogs, there may be less pressure to codify or improve it.

Subject cataloging is not the only, or even the chief, obstacle to user success in retrieving materials. A recent study found that the inability of patrons to use the catalog properly accounted for only 22 percent of retrieval failures [7]. Libraries may prefer to place their emphasis and resources where user success would be most affected: on collection development, circulation control, or user training.

The lack of a subject cataloging code is itself part of the problem. Cutter's *Rules* included all of the elements of cataloging in a single code. But the elements were immediately split and separately developed, first by the separation of subject cataloging and classification at LC, later by the separation of subject cataloging and descriptive cataloging (including choice and form of proper names). Library of Congress catalogers now make Solomon-like decisions about which division is responsible for establishing the headings for named entities. Perhaps the present discussions about "whole-book cataloging" are an indication that this separation of cataloging functions has not worked well.

The almost continuous revision of the *Anglo-American Cataloging Rules* and previous codes for descriptive cataloging and name headings has impeded the development of a subject code. There are several reasons for the emphasis on codifying one cataloging function at the expense of others:

1. Librarians believed, at least until recently, that most users consulted the catalog for known items [8]. The subject catalog can be used for this purpose, but usually known items are located through author or title entries.

2. Subject headings, which often represent abstract concepts, are more difficult to codify than named entities.

3. It is easier to modify a code than to develop one in the first place. In fact, once a descriptive code is in existence to provide an evaluation standard for cataloging effectiveness, revision is inevitable.

4. "Fundamental change is slow to come when the process is controlled by individuals involved in detailed practice" [9, p. 318].

The implementation of the second edition of the *Anglo-American*

Cataloguing Rules (AACR2) in the early 1980s consumed enormous amounts of time. Technical services personnel changed thousands of entries or tied new and old forms of name headings together either within one catalog or between two catalogs. Public services librarians also learned the new rules and retrained patrons. In many cases, searching time was increased by the necessity of looking in at least two places for headings. Since the time used for these activities was not available for other purposes, it might be difficult to convince librarians who postponed or cancelled pet projects during AACR2 implementation that these projects should be deferred again during the implementation of a subject cataloging code.

LC's willingness to change policies in response to outside criticism lessens the pressure for a code. In the late 1970s, LC changed hundreds, perhaps thousands, of terms that had been criticized as derogatory, insensitive, culturally biased, or obsolete. LC is now evaluating the cross-reference structure to clarify relationships and to eliminate inappropriate references. Some subject heading forms are no longer used for newly established headings.

We have been like the Little Red Hen's fellow creatures in the children's story. We have waited for LC to plant, cultivate, harvest, thresh, and grind the wheat and to knead and bake the bread. Yet, when we have been allowed to eat the results (which the Little Red Hen's fellow creatures were not permitted to do), we have complained because the bread is pumpernickel and we wanted banana nut.

"The price one pays for an index generally reflects one's share of the total cost of producing it" [10, p. 39]. Yet, the LC labor, including the intellectual effort, is free. Since there is no such thing as a free lunch, we have paid a price in other ways: by using a system that was designed for a different collection than our own and by incorporating its inconsistencies and problems into our own procedures. On the other hand, after ninety years of acceptance of LC subject headings, a philosophical code would have to be operational with the *Library of Congress Subject Headings* list as a supplement since libraries would be unlikely to recatalog older materials to fit into a new system.

The Library of Congress changes, including the practice of authorizing free-floating subdivisions, do make headings more predictable. In some cases catalogers can establish new headings without waiting for LC. But the practices and the direction of subject cataloging have seldom been studied or even discussed. There are, for example, some drawbacks to the increased use of subdivisions, including users' inability to understand long strings of terms [11, p. 384], the inconsistent placement of geographic subdivisions, the lack of authority control in LC's online

system, the absence of a cross-reference structure, and the possibility that the headings will degenerate into classed forms. The reluctance of librarians to address these concerns is not encouraging when we consider the philosophical issues that must be resolved if we wish to develop a subject cataloging code.

It is impossible to evaluate the effectiveness of subject cataloging without a statement of the objectives it is expected to achieve. These are based on the functions of the subject catalog. Cutter stated them as:

"1. To enable a person to find a book of which . . . the subject is known, and

"2. To show what the library has . . . on a given subject" [1, p. 12];

"3. Bringing books together which treat of the same subject specifically" and "which treat of similar subjects" [1, p. 16].

Dunkin pointed out that the first two of these (and Cutter's other pairs as well) are antithetical, and, when combined with an appeal to user convenience, they produce differing but equally logical results. It is difficult to treat a work both as an individual item and as a member of a group. It is even more difficult to try to establish headings on the basis of user convenience since user needs are not uniform, cannot be predicted, and have not been fully identified in use studies [12, pp. 139–42]. "A system is convenient only so long as it is a system" [12, p. 142], but what we have "represents a hopeless attempt to combine the two intrinsically incompatible alternatives—to have a system, but to modify it so that it will serve all users equally well" [13, p. 141].

It is difficult to identify the objectives of the subject catalog, even if they are not based on unpredictable and unmeasured user needs, since some librarians emphasize the catalog as a finding tool and others see its collocation and syndetic features as more important [14, p. 117]. "We must decide whether the function of the catalog is to be an alphabetical quick reference finding tool, a scholarly and exhaustive bibliography, or a logical and systematic arrangement of the fields of knowledge" [15, p. 72].

In 1952, Carlyle Frarey summed up the chief conclusion of a week-long seminar on the subject catalog as a lack of consensus on its objectives [16, pp. 218–24]. Recent studies of online public access catalog (OPAC) usage have pointed this up yet again since users frequently demand information which subject cataloging has not been designed to provide [17]. A code must rest on the objectives and evaluation standards for the procedures we codify. If we cannot agree on our objectives, we have no philosophical basis for choosing one approach over another.

Perhaps the lack of clear objectives for a subject catalog stems from

confusion about the definition of a subject. (In the following discussion, the terms "subject" and "subject heading" refer to topical headings and not to the other types of headings included in the subject catalog: names of all sorts, forms of publication, language, and chronological periods.)

Cutter defined a subject as "the theme or themes of the book, whether stated in the title or not" [1, p. 23], and as "the matter on which the author is seeking to give or the reader to obtain information" [1, p. 16]. But in Cutter's day, knowledge was conceived as highly structured. Even though a cataloger used subject headings that listed each subtopic directly, the subtopic was identified within a hierarchical structure. Thus, a cataloger began with a notion of a general topic and worked down to the lowest point in the topical hierarchy that fit the work in hand [18].

Today we no longer have the same mental outline of recorded knowledge. Although in many libraries the same person assigns the subject headings and the classification number, and although the Library of Congress *Subject Cataloging Manual* [5] says in several places that the first subject heading and the classification number should agree, the approach is different than it was in Cutter's time. Under present practice a subject cataloger analyzes each bibliographic item from within to determine its subject. Once the cataloger has identified a subject, it must be translated into a subject heading and fit into the classification system.

This notion that we can express the overall content of a work by using a subject heading at exactly the same level of coverage as the work itself is what we mean by "specificity." Both subject and specificity are relative terms. A subject, no matter at what level, is not a discrete entity but part of a continuum. "Subject matter is almost infinitely divisible," because "the power of the mind to frame distinctions is practically without limit" [19, p. 236].[2]

We could break the subject continuum at any point. We break it at the level of a bibliographic unit because this agrees with the descriptive cataloging definition of an item and because the number of entries in the subject catalog is, for the most part, manageable and searchable. But the subject itself is not treated uniformly in bibliographic units. Sometimes it is too narrow because it is a subtopic, sometimes it is too general, and sometimes it is exactly right.

In practice, it is impossible to apply specificity to every work [20]. We cannot establish a new heading and all required cross-references for nearly every work cataloged, so some minute subjects are entered under more general headings. On the other hand, some subject headings are

2. Metcalfe attributes the idea to E. Wyndham Hulme who in turn based it on the logic of John Stuart Mill.

used so often that they become unsearchable because of the large number of titles listed under them. They can be broken apart by subdivisions or by establishing headings for the subtopics formerly included under the broader heading. This means that some subjects are defined much more precisely than others in the *Library of Congress Subject Headings* (*LCSH*) list; the precision will also vary from one library to another.

Cutter recognized in his third objective that direct and specific headings scattered related information alphabetically. In order to tie related headings together, he suggested a network of see-also references that would lead to the next level within the hierarchy of a subject field or across subject fields to headings at the same level within other hierarchies [1, pp. 79–80]. This assumed that each subject field would be organized and verbalized so that the necessary relationships would be obvious. Instead, cross-references have been made at the whim of catalogers and often do not reflect either preexisting relationships or hierarchical structures within subject fields.

Given the large number of see-also references under many headings in the *LCSH*, the difficulty in integrating them into a local catalog where many of the other headings referred to are not in use, and the need to revise the catalog as they are changed, it is not surprising that many libraries have decided not to include them in the subject catalog [2]. But without these references, subject catalogs and subject searches are incomplete. Yet providing the references can also be a disservice to searchers because they often create a criss-crossing and seemingly endless trail of additional headings that are not clearly related to the searcher's query. The Library of Congress has already begun to use designations for the type of relationship and will evaluate each of the references as time permits. But once again the structure will be imposed on varying practices and philosophies followed over nearly ninety years.

Subject headings are precoordinated by combining the terms, topics, concepts, or aspects into a single statement. The cataloger uses the *LCSH* list to find the heading that is closest to the desired level of specificity. This established heading, which is accepted in all libraries that use the *LCSH* list, is called a "uniform heading." However, if there is no established name for the subject or no heading in the list, the cataloger must either put the work under a more general heading or try to find two or more headings that together approximately cover the work even though this practice contradicts the principle of precoordination.

Sometimes two or more headings are used when a single heading would be complex and confusing or when it would require an enormous number of cross-references. For example, consider a recent book titled *Cannery Women, Cannery Lives: Mexican Women, Unionization, and the California Food Processing Industry, 1930–1950*. Rather than combine all

of the elements into a single subject heading, the Library of Congress subject cataloger assigned four subject headings:

1. United Cannery, Agricultural, Packing, and Allied Workers of America—History.
2. Women in trade-unions—California—History—Case studies.
3. Mexican American women—California—History—Case studies.
4. Women cannery workers—California—History—Case studies.

Theoretically, a single subject heading could replace the last three assigned by the Library of Congress: "Mexican American women cannery workers in trade-unions—California—History—Case studies." But if each subject heading were tailored to fit a single title and cross-references were made for each element that was not the entry word, the subject catalog would quickly fill up with single-entry headings and a very large number of cross-references.

The subject heading is not structured hierarchically even though the subject itself is conceived as part of a hierarchy. In order to use specific entry, the entry term and thus the access to the heading should agree with the overall level of specificity of the work itself; in other words, the heading should lead directly to the level of specificity of the work. However, some subject heading structures violate the principle of direct entry by using an entry term that is more general than the heading as a whole, and the same term may appear in both direct and inverted headings (for example, Normal numbers but Numbers, irrational). Cutter advocated inverted headings in some circumstances to overcome alphabetic dispersion of related materials [1, pp. 72–75], but this form is no longer used for new subject headings. A major drawback to cataloging without a code is that catalogers outside the Library of Congress cannot formulate new headings within the *LCSH* structure in the same manner in which they can establish names under AACR2. A cataloger must use an already established heading, even for a new topic or subtopic. When the Library of Congress creates a new heading, there is a delay between LC's use of it and its appearance in an *LCSH* supplement for use by other libraries. "The shame of it is that the cataloger who has analyzed the work and established the 'book entity' cannot pass his knowledge on to the reader but must frequently lose it under general headings chosen from an inflexible subject heading list" [21, p. 196].

One way to understand the concept of a subject (as represented in the catalog by a subject heading) is to analyze what it is *not*. A subject heading is not a statement of the information contained in a work but merely a summary of the chief matter or theme discussed. A searcher must first translate a query into the general topic and then into the subject heading that will be most likely to contain the needed informa-

tion. Subject headings are not weighted or sorted by relevance to predicted queries. There are no stated criteria for relevance nor any standard against which to measure it. Subject headings do not usually reflect the author's point of view or the critical reaction to the work. The cataloger is not expected to consult review sources to determine the subject and cannot evaluate the work without the time to read, watch, or hear it.

Subject headings do not indicate whether a work is considered authoritative within its subject field. Usually a work is not recognized as authoritative until long after it is published or issued; cataloging practice does not include systematic reconsideration of previous cataloging to add or change subject headings in accordance with the later evaluation of a work. Furthermore, subject headings, with the exception of a few subdivisions for juvenile and popular works, introductions, and textbooks, seldom give an indication of the intellectual level of a work; a user cannot usually tell from the listings in the catalog which works will best suit his or her knowledge of the subject while conveying some new information [22, p. 177].

Many of the clues that catalogers use in determining the subject are not transcribed for the searcher although the recent OPAC use studies list them as expected or desired features. These include the table of contents, bibliographies, indexes, annotations, summaries and abstracts, introductions, titles of parts of collections, blurbs from book jackets, evaluation information, and classified lists of headings [17]. At present we are like the mystery author whose fictional detective reads a telegram and cries "Aha!"—but without conveying the clues in the telegram to the readers.

Criticisms of the lack of depth in subject cataloging include the few subject headings assigned per title and the absence of natural language terms to augment the controlled vocabulary headings [23, pp. 17–20]. These criticisms point up once again that subject headings are essentially summaries of what documents are about, using phrases or strings of words to represent the topics identified.

The great mystery of subject cataloging is how a cataloger determines "aboutness" and translates it into a subject heading. Most cataloging texts gloss over this point entirely with a statement such as, "Ascertain the real subject of the book, that is, what the author had in mind when he wrote the book" [24, p. xiii]. Instead of describing the mental processes involved, cataloging texts list the sources that will help. In books, these include the title and subtitle (although they can be misleading), the publisher's blurb, table of contents, preface and/or introduction, abstract or chapter summaries, bibliography, and, perhaps, index and supporting claims.

Since cataloging texts do not describe the techniques used by catalogers to determine aboutness, it may be possible to infer them by analogy to the mental processes used in reading or to the knowledge base and procedures built into artificial intelligence systems.

The reading technique of skimming has some of the same purposes as subject cataloging: to identify themes and purposes and to determine the overall topic discussed in a work. The skimming techniques advocated by Adler and Van Doren are similar to the instructions for cataloging in the preceding paragraph. One looks at the clues provided in the work itself, including the table of contents and other sources, spots crucial terms, and watches for summary statements. On the basis of these, one "pigeonholes" the book by determining the overall theme and where it fits into the structure of the subject field. The ability to do this depends in part on the work itself but also on the reader [25]. We like to think that the text conveys a message, but that is only partly true. Readers (or catalogers) project their own perceptions, experiences, and level of comprehension onto the text. Each reading experience, even by the same person, is unique [26, pp. 22–82].[3] There is always a degree of tension between the new information and what the reader already knows or believes [27, p. 24].

Another clue to the techniques used to determine aboutness in subject cataloging comes from the field of artificial intelligence. If it is possible to have subject cataloging done by an expert system, then the development of such a system depends on a clear understanding of the mental processes human catalogers use. These processes include analogy, relevance, selectivity, research, expert advice or exchange of information, background knowledge and experience, memory, and the reputation of the authors cited [28]. An effective expert system must build a knowledge base that can analyze verbal clues in context and compare them with similar materials for consistent treatment.

The limits of artificial intelligence indicate the power of the human mind and how little we know about it. A knowledge base contains hundreds of rules, which are as difficult to maintain and apply consistently as they are to develop and construct [29], but most machines can handle only one task at a time, and they have as much difficulty in

3. Simsova summarized several theories about how we mentally organize our perceptions. One early theory was propounded by Nicolas Roubakine, Director of the Biblio-Psychological Institute, Lausanne, Switzerland, between the World Wars. In "Reader, Know Thyself!" (*Library Journal* 59 [April 15, 1934]: 344–46), he said, "The difference of judgment does not solely depend on the book, but on the reader. In fact the reader—with his intelligence, his standard of development, his tastes, his interests, desires, feelings, impulses, instincts—confirms himself in each one of his personal opinions and criticisms" (p. 344).

constructing multi-term headings as human indexers do [30]. The social and pragmatic implications of human communication present problems that cannot be solved by the semantic and conceptual rules built into machine systems. Clearly, a knowledge base cannot equal the range of human experience, so heuristics tries to identify the most potentially useful information and examples. But the human mind can handle ambiguity, use more than one approach to a problem, bring in information from the fringe of consciousness, and draw on a large number of examples in perceiving analogies [31]. "Initially, at least, it is exacting enough to ask that a computational theory represent the mediocre thinking of the average person on an off-day" [31, p. 299].

Many of the analyses of mental processes assume that a cataloger first breaks down the work into key terms or concepts and then synthesizes them into a single summary statement. If the Gestalt psychologists are correct, this should be impossible because these functions are performed on opposite sides of the brain and because "the whole is greater than the sum of its parts" and is perceived in its entirety. It is like the difference between the description of a forest from an airplane and, tree by tree, from the ground. The mind cannot view the forest from both perspectives simultaneously; there is a perceptual gap that must be bridged somehow, perhaps by intuition or by insight rising from the subconscious. "We have not yet discovered the linguistic algorithm in the human brain for summarizing of content or indexing" [32, p. 326]. We know that both searchers and catalogers succeed in bridging the gap regularly, but, since we cannot explain it, we cannot codify or evaluate it.

Once a subject is recognized or identified, the cataloger checks the *Subject Cataloging Manual* [5] to determine the subject treatment. Then the *LCSH* is checked to find the heading or headings that most closely match the cataloger's conceptualized subject. Often the see-also references listed under a heading in the *LCSH* will lead a cataloger to a more precise heading. If subdivisions are appropriate, they may be listed specifically in the *LCSH,* but they must usually be established according to the general provisions in the *Subject Cataloging Manual,* subject to specific exceptions in the *LCSH.* Once again there is a mystery. Both the cataloger and the searcher must determine the best words of a subject phrase, and it is not clear how they do this although even untrained users have no difficulty [33, p. 194].

Theoretically the application of a subject heading from the *LCSH* list provides a uniform heading that brings together related works in the catalog. In practice this occurs only if the cataloger recognizes the similarity between works and understands the definition of the subject heading so that it is used consistently. We are back to the realm of the incalculable here. What makes two documents similar? How does the

mind work to relate them, especially if they are not cataloged at the same time? How can we build definitions into the list so that different catalogers will assign the same heading to the same or related documents? A study by Ann Painter in the early 1960s found that consistent application of subject headings by both human and machine indexers was only 62 percent to 72 percent [34].

In general, the effectiveness of the subject catalog can be measured by its ability to lead users to the information they need. The effectiveness is usually based on the extent to which all relevant materials are identified by a query (recall) but no irrelevant materials are identified (precision) [35, pp. 223–46]. There are some serious drawbacks to this basis for evaluation.

First, recall and precision are opposites and the attempt to improve one will worsen the other. Recall depends on exhaustivity (that is, identifying everything possible) and precision on selectivity.

Second, the measurement depends on the concept of relevance. This is an undefined term unless it is based on factors that works must possess in common or on some external criteria to which they must be related. But even if we could identify intrinsic factors or external standards, there is no assurance that the works that meet this definition of relevance will be pertinent to an unforeseen future information query [36]. "There need be no relationship known to logic between a text and a problem it helps someone solve" [28, p. 49]. The information that a searcher finds useful depends not only on the cataloging system but also on his or her past experience and knowledge, particular information need at the time of the query, and skill in formulating a search strategy. All of these factors are outside the scope of a cataloging code.

Third, relevance measures the effectiveness of the subject catalog according to user needs although the subject headings are based on the works being cataloged and not on their potential uses. "The subject catalog can be judged only by the criterion of convenience and the best that can be attained is a number of approximately satisfactory entries" [37, p. 98]. Of course, the purpose of the subject catalog is to lead users to the materials they need at any particular time, but guessing at what those needs will be is no basis on which to construct a code or even an individual subject heading.

The premise of this discussion is that a code must be based on theory and not consist merely of rationalized procedures or a string of arbitrary rules. But theoretical discussion is pointless if we cannot afford to change our approach and if our aim is user convenience that cannot provide guidance for present practices. A topical subject is not an identifiable entity like a name; it is defined by individual perceptions that

we do not understand and cannot describe. The measures we have used to evaluate the effectiveness of subject cataloging have been based on the concepts of specificity and relativity that change definition depending on the context.

However, there are practical steps we can take to make subject cataloging more rational and subject searching more predictable. Some possible improvements are:

1. We can continue to modify the terminology in the *LCSH* list to language that is current and unbiased. We can also add new headings in a timely fashion. We can encourage the Library of Congress to streamline the present time-consuming and complicated procedures for suggesting new headings so that more non–Library of Congress catalogers can participate in this endeavor. Libraries can also suggest cross-references based on unsuccessful search queries or perceived needs in their local libraries.

2. We can continue to reduce the variety of subject heading forms and identify the situations when each is the best choice. We can also discuss whether the increased use of subdivisions is the most beneficial direction in which to proceed.

3. We can improve the cross-reference structure by evaluating the present references and eliminating inappropriate ones. We can then use the cross-references to determine the structure of each discipline in the subject catalog. Perhaps we can alter the structure to agree with the perceptions of practitioners in each field.

4. We can work with online vendors to increase access to present information and to add new kinds of information to OPAC records. In addition, we must be able to revise and update headings easily using global editing. The online authority file must include subdivision control.

5. If the present amount of subject information is inadequate, we can enhance it in two ways: by using more analytical subject headings and by adding other fields for natural language terms [38].

6. We can emphasize subject catalog searching techniques in bibliographic instruction programs.

7. We can encourage the Library of Congress to add information to the *Subject Cataloging Manual.* Some topics that are missing or inadequately covered are: the sources LC catalogers use to determine the subjects of works; a description of all subject heading structures and when to apply them; and the treatment of some major disciplines.

8. We can work toward an authority control system that recognizes equivalencies and allows different headings to be used in different libraries.

Thanks to the initiative of the Library of Congress, experiments in several other libraries, and the creative use of online catalogs, many of these developments are already underway.

True, even all of these measures together do not provide a code that answers the questions discussed in the preceding pages: How does a cataloger recognize a subject? What guidelines can we provide to ensure consistency in subject headings assigned to similar materials? How can we define specificity to fit all situations? If we cannot use relevance as a standard because it is based on unpredictable future information needs, can we agree on other objectives for the subject catalog that will enable us to measure its effectiveness?

Librarians have asked and debated these questions for nearly one hundred years without reaching a consensus on the answers. Maybe we should be satisfied to improve the process of subject cataloging even if the philosophical answers continue to elude us. If, as seems likely, the measures listed above result in more systematic procedures, more consistency in subject headings assigned to similar materials, more predictable subject heading forms, and increased searching success, they are worth pursuing. It is time for all of us to help to cultivate the wheat and make the bread.

> Perhaps I should,
> As certain educators would,
> Content myself with the conclusion;
> In theory there is no solution.
> (W. H. AUDEN, "The Labyrinth" [39])

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