

# Online Classification Number Access: Some Practical Considerations

by Janet Swan Hill

**Discussions of subject access in online catalogs have included classification number searching and shelflist browsing capabilities. Many factors restrict the usefulness of such a system feature. Methods for overcoming these handicaps potentially exist, but assessment of their relative utility, expense, and likelihood is necessary. Priorities for development and implementation need to be considered.**

For centuries there have been individuals whose pleasure or life's work it has been to attempt to devise methods whereby the whole of human knowledge can be logically arranged. One of the earliest major figures was Aristotle, who is credited with creating a classification framework "designed to aid the mental plotting out of the universe of thought and objects," and with working out a definite system of arranging books that was afterward adopted by the "Kings of Egypt."<sup>1</sup> Nineteen centuries later in "On the Advancement of Learning," Francis Bacon devised a classification scheme that also had considerable impact in the fields of both logic and librarianship.<sup>2</sup> Many classificationists have spanned the years in between and since. The most influential of this century is S. R. Ranganathan.

The impulses for classification study are varied. Aside from philosophical questions such as "What is the proper order of things, and the relationships among them?" and the diversion supplied by approaching classification as a logical or mathematical problem, other concerns such as the need to communicate precise information across language barriers,<sup>3</sup> the need to provide a useful framework for published bibliographies or catalogs, and the need to devise methods for reliable and rapid machine query, have had immediately identifiable practical purposes that could be appreciated by even the most pragmatic minds.

## Present Classification Climate

The classification impulse with which most librarians are familiar or sympathetic is that which arises from the need to organize the universe of knowledge as represented by materials in a library in a physical way so that the materials can be conveniently maintained, added to, and used.<sup>4</sup> Although Melvil Dewey's work retained a strong connection to the philosophical framework of Bacon and his successors,<sup>5</sup> and was arranged to fit into a theoretical model, Dewey himself was struggling with the practical difficulties of arranging books in a particular library when he devised his Decimal Classification system. In describing his scheme some years later, Dewey emphasized his concessions to the needs of practicality, observing that

everywhere filosofic theory and accuracy hav yielded to practical usefulness. The impossibility of making a satisfactory clasification of all knowl-ej as preserved in books, has been appreciated from the first, and theoretic harmony and exactness hav been repeatedly sacrificed to practical requirements.<sup>6</sup>

The Library of Congress carried Dewey's practical trend many steps further, and a theoretical basis for library classification was specifically eschewed when in 1900 Librarian Herbert Putnam decided that the Library of Con-

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gress should devise its own classification scheme, designed to fit its own particular collections and service needs.<sup>7</sup> The classification system which resulted is based on literary warrant, and reflects the actual holdings of the Library of Congress. It is almost totally enumerative, and devices for expansion of printed numbers are not based on a uniform theoretical model, but vary according to convenience from one class to another.

**Call number as location device.** It's no wonder then, given the warning of the creator of one of the United States' two most used classification systems, and the clearly declared nontheoretical nature of the other, that call numbers are viewed by many librarians who assign them as means to the end of arranging and locating books, and not primarily as precise and intellectual representations of the subject content of the works classified. But the thought that the formulation of the perfect call number is a great good pursued uniformly by library processing staff no matter what the cost is an idea that dies hard, and some librarians continue to regard the assignment of the right classification number as a kind of crusade.<sup>8</sup> The very complexity and length of the tools involved in assigning numbers (the Library of Congress schedules occupy more than six linear feet of shelving, and the 19th edition of the Dewey Decimal Classification is nearly 3,400 pages long) would seem to support this perception, since it is difficult to imagine that so much time and trouble would be spent devising call numbers that are only close approximations of the subject content. There is no doubt that to make today's predominantly open stack libraries more usable, librarians do go to great lengths to arrange collections, primarily via call number, in a semblance of subject order. The perception is mistaken all the same.

In addition to the nontheoretical nature of the classification schemes themselves, there are other reasons why the "call number as location device" view is the one which holds sway in today's operational arena. A prime reason has to be the difficulty experienced by classificationists in devising a universal, usable, flexible, generally acceptable, updatable scheme for the classification of knowledge. Despite considerable efforts directed toward this end, even dedicated groups such as the British Classification Research Group (CRG),

and the Committee on Classification Research of the International Federation for Documentation (FID/CR) have eventually turned toward creating smaller schemes with specialized applications. A general system has yet to be designed or acclaimed. Some would say that Ranganathan's Colon Classification comes close, but even its admirers are slow to claim that it is simple to use when applied fully, especially in regard to shelving and shelf browsing.<sup>9</sup> Classification schedules whose primary aim is to organize library materials along subject lines, however, have been devised. Each such system has weaknesses, but in schemes that do not claim to be ideal, some flaws can be tolerated.

**Economic pressures.** Another explanation for the current role of classification is actually a concatenation of reasons that can collectively be called economic pressures. Even in the fair economic climate of the 1960s, work to be done in libraries exceeded the staff available to do it to perfection. Increasingly, traditional activities have been examined in terms of costs, cost/benefit, and cost effectiveness. These considerations have aided the development and spread of practices such as "mark and park" (acceptance without revision of call numbers assigned by some other agency, usually the Library of Congress), nonrevision of call numbers when class numbers are revised, arbitrary shortening or simplification of classification numbers to meet the needs of computer systems, printing capabilities, etc.

**Use as a shelflist.** A final reason may be both cause and effect. For more than 100 years in the United States and many other countries, the primary avenue for subject retrieval of materials in a library collection has been an alphabetically arranged dictionary or subject card catalog, where the emphasis is on subject headings, titles, and other entries.<sup>10</sup> The classed catalog, once a rather common and highly regarded means for public access to subject information, has become today's shelflist, and is now largely an internal file, usually unavailable to the public. Its primary use is in inventory control. Even the call number searching capability in many of today's online catalogs is a thinly disguised shelflist access. Very few systems incorporate a call number or shelf browsing capability, so although

they work well for item searches, their use in a true subject search is limited.<sup>11</sup>

### **Increased Potential for Classification Retrieval**

The strong entrance of computer technology into libraries in the 1960s sparked renewed interest in classification, as the capabilities of earlier machines led many to seek avenues for machine query that were easier to handle than words and text strings. The availability of online searching of remote bibliographic databases also gave rise to new consideration of classification schemes as tools for enhancing retrieval. Since the early 1960s, the Universal Decimal Classification (UDC) system has been used in a computer context to assist in the production of bibliographies and subject indexes, and in Selective Dissemination of Information (SDI) services.<sup>12</sup> Several information retrieval databases have their own computer-related uses for class numbers, although notations are usually devised for the specific database or are derived from the discipline being searched, rather than being assigned from a widely used library classification system.

Perhaps because such databases are often the province of commercial bodies that must consider profitability and their own often narrow goals, they have seemed to be beyond librarians' power to influence. A more recent development in library use of computer technology strikes closer to home.

**The online catalog as an operational reality.** From its position as a theoretical possibility discussed as part of a moderately distant future in the mid-1970s, the online catalog has emerged in the early 1980s as an operational reality, and one which librarians feel competent to comment on and to mold. Although the primary concern in developing online catalog technology has been the provision of satisfactory retrieval of bibliographic records via the verbal access points of author, title, series, and subjects, the possibility of using classification numbers in subject searching has also received some attention. Online access via call number or classification<sup>13</sup> was one of the topics afforded major consideration at the 1982 Council on Library Resources' special conference on subject access.<sup>14</sup>

Librarians are only now attempting to assimilate the reality and poten-

tial of online catalog access via subject headings and subject terms, so it is not surprising that some are reluctant to turn their attention to another type of subject access at this time. But although verbal representations of subject content such as subject headings, keywords, and other descriptors have received most of the United States' subject analysis attention in recent decades, verbal and notational depiction of the subject content of individual works are merely two aspects of the same problem, and it is increasingly difficult to leave untended the topic of notational classification.<sup>15</sup> Classification theorists typically find it difficult to think about one without the other, and often use some of the same terminology to discuss both.

It is not classification experts, however, who will initially determine how or whether online catalogs will incorporate class number searching. It is more likely to be catalog and information access generalists who will have the greatest impact. Generalists and specialists alike cannot but recognize that in addition to the traditional views of catalog data searched and organized by verbal headings, online catalogs have the capability to provide through computer manipulation of records another valuable arrangement of information—the classed catalog. The library profession effectively jettisoned the classed catalog from its complement of bibliographic access tools in the last century, not because the classed catalog was unuseful, but only because it was less useful than the dictionary catalog that replaced it and even without the classed catalog the shelves continued to provide classified subject access to the patron willing to browse. While libraries were bound by the limitations of the card technology, they could not afford to supply both types of catalogs. Online technology can potentially supply both and more.

### **Effect of Past and Present Practice on the Effectiveness of Class Number Access**

Despite the advantages that may accrue from adding another technique to the arsenal of search strategies available from online catalogs, class number access is not without defects and potential handicaps, especially in light of today's and yesterday's practices in assigning call numbers. To proceed with designing online classification access in a rational way, with realistic expecta-

tions, and a decent understanding of what remains to be done, librarians need to recognize some of the problems inherent in past and present classification practice.

**Classification schemes are not easy for users to figure out.** It is difficult to tell what patrons think about call numbers assigned to library materials, but regardless of whether a user believes that the classification number reflects the precise subject content of a work, it is a rare user who knows how to interpret any but the most basic parts of a number. Less common still is the user who can manufacture a class number on his own. One of the commonly held tenets for online catalogs is that they should be directly usable by patrons, and that they should not require an "expert" intermediary in the way that other information retrieval databases do. For class number access to meet this aim, a system of user aids would need to be devised and made available. Even then, it is likely that class number access would be used by fewer people than could profit by it, and would be used badly by some.

Without understanding the classification system, and lacking user aids, a user can still obtain a class number to search from a work already known to be on the desired subject. A similar widely recommended tactic instructs catalog users to consult subject heading tracings present on relevant records in the catalog, and to use the headings found to refine or broaden a search. A class number search performed along these lines could be quite helpful, but because the user's grasp of the meaning of the numbers may be close to nil, the search could also yield unsatisfactory, unexpected, or even bewildering results.

**Classification numbers have not remained static.** Classification numbers have changed as fields of knowledge have changed. Although most classification schemes try not to re-use old numbers for some period of time, and generally resist wholesale relocation of subjects, re-use and relocation nevertheless happen frequently. Between the 14th and 17th editions of the Dewey Decimal Classification, for instance, nearly 2,400 numbers were relocated, and the process of revision continued unabated through the 19th edition.<sup>16</sup> The Library of Congress uses more than 400 pages a year to issue revisions to its

own schedules, and a significant portion of revisions are changes in the scope of numbers and in the location of subjects. Added to the problem of number relocation is the matter of increasing complexity and detail in classification schedules. Topics that were once general divide and subdivide, and material that used to belong in an umbrella number now gets a class number of its own.

It is an uncommon library of significant size that can afford to reclassify all previously cataloged materials just to reflect changes in the classification schedules. Since reclassification can involve intellectual steps as well as physical handling, even the computer's ability to alter every occurrence of a particular character string will still leave "reclassified" items marked and shelved as before.

The availability in machine-readable form of classification schedules and correlation tables, and references between old and new numbers, and among different schemes could provide the initial resources that would enable a computer to retrieve relevantly classified material regardless of the age of the cataloging, and regardless of the classification schedule used,<sup>17</sup> while still leaving the items themselves with their original markings. Although such a capacity would ease the retrieval of differently classified material, it would probably not signal freedom to reclassify whole collections, since the confusion of patrons searching one number in the catalog, and retrieving another number from the shelves could be considerable.

**Classification numbers are sometimes inconsistently assigned within a library.** They may be consistent with themselves while being at variance from general practice. For example, area collections may choose to emphasize geography over topic in call numbers while the remainder of the library classifies topic over place. Special Collections material may be classed with locally developed schemes, some departments may use Dewey while others use LC, previous standards for minuteness of classification may have had to be revised to fit with card printing or computer display capabilities, and major portions of a collection, such as journals or fiction, may be unclassified.

**Classification numbers grant only one opportunity to portray the subject content of a work.** Classification num-

bers as currently assigned must be broad enough to encompass the subject content of an entire work. A work, however, may have several identifiably different topics which can be denoted by discrete subject headings. As a result of the noncorrespondence between a single call number and multiple subject headings, it might be expected that much less on a particular topic will be revealed through a search under classification number than is actually present in a catalog. Kelley's classic investigation of the usefulness of classification to the library user bore out this expectation.<sup>18</sup> She found that for three selected subject headings (Beaver, Buffalo, Cormorant), only about one-third the number of titles found by a subject heading search would have been found via a search under the specific call numbers.<sup>19</sup> A more recent test in the Northwestern University Library catalog yielded far less tidy results and illustrates an unpredictability of representation that depends on the minuteness of the classification scheme on a particular topic and on the specificity of the related subject headings. In the case of "Beavers," one quarter the number of titles found under subject heading were retrieved by classification number, but because the relevant Dewey number covers all Sciuromorpha, half the items found were on chipmunks and prairie dogs. "Immortality" yielded 180 titles, but a search of the most relevant class numbers brought to light only 5 percent of that number. A search of "Family Size" retrieved five times as many titles under class number as under subject heading, but because of the broadness of the applicable class numbers, which encompassed such topics as marriage and birth control, most items found through the shelflist were irrelevant to the heading. The most that can be concluded from results such as these is that a class number search will find different works than a subject heading search for the same topic, but just how they will differ cannot be reliably predicted.

Gorman has suggested that the dichotomy between the class number as shelving device, and the class number as subject retrieval device could be solved through the assignment of more than one class number to each item. One relatively general number would be used for shelving, while, to enhance the classification retrieval potential of the database, one or more precise class numbers would be assigned as appropriate to

express the different subject aspects of a work.<sup>20</sup> Aside from the unavailability of a suitable MARC field for such numbers, a matter that could be remedied, the greatest objection to the proposal could be economic, as library staffs that have already been relieved of even verifying pre-assigned call numbers are asked to assign multiple new numbers. Perhaps it is thought that the Library of Congress could be prevailed upon to assign multiple detailed class numbers (presumably both LC and DDC) on behalf of American libraries, but LC has already shown its vulnerability to economic pressures in the area of enriched subject access in connection with their investigation into the feasibility of assigning PRECIS strings to their records.<sup>21</sup>

**Classification numbers are often not really assigned.** Economic restraints combined with the wider availability of shared cataloging have resulted in a situation where classification numbers are increasingly assigned by persons remote from the particular library's catalog. In many libraries, call numbers complete with author Cutters, are simply accepted from incoming copy by clerks who neither examine nor understand them. Such acceptance effectively prevents consistent use of local classification schemes or local emphases within a common scheme. Unreviewed acceptance also means that mistakes and differences in viewpoints and practices from an assortment of libraries are incorporated into a single collection without a coordinating effort. Classification inconsistency is thus inevitable in the online catalog using these numbers, and builds potential unreliability into call number searching.

**Classification numbers are not assigned with a view to subject searching.** Unfortunately, not "every library [is] filled with people debating the finer points of the Dewey Decimal System."<sup>22</sup> As Gorman has observed, librarians in the United States are predominantly uninterested in classification theory, and are instead concerned with storage and retrieval of individual items.<sup>23</sup> This outlook and the widespread acceptance of practices such as "mark and park" and nonreclassification have contributed greatly to a general denigration of care taken in classification. It contributes to inexactitude in classification, which is a problem for the quality of class number

retrieval, and to altering the profile of processing staffs in libraries, which is a problem for libraries being able to perform additional or more exact classification. It is an axiom of organizations that once a function has ceased to be performed, or a particular duty has been relinquished, especially if staff have been surrendered or diverted to other tasks, it is difficult to begin it again. Even if classification were immediately and overwhelmingly recognized as a top priority for subject access in online catalogs, there is a considerable inertia of present practice and staffing to overcome in order to achieve the desired end.

**Classification number structure is not so well suited to machine searching as might be thought.** Possibly because classification schemes are composed mainly of numbers and other symbolic devices, and because in spite of our knowledge to the contrary, they seem to be formed on a theoretical basis, it may appear that class numbers are better suited for machine manipulation than are words or text strings. Several factors, however, make computer manipulation less simple than might be thought.

*Limited effectiveness of truncation.* Many online catalogs allow users to generalize a search or to compensate for insufficient confidence in a search term by means of truncation. Thus a user unsure whether material will be entered under "aeronautics" or "aeronautical" can search a truncated "aeronautic#" where # signifies a truncation) and retrieve both. The usefulness of truncating words, of course, depends on the words themselves. Not until "aeronautic" is truncated to its first letter, for instance, will it retrieve "airplane" in the same search. Truncation of class numbers might seem to be even more useful than truncation of words, but it too is subject to limitations. The predominant difficulty with the truncation of LC numbers is calling up a far too general result. Off-target retrieval can also be a problem. For example, truncation of the LC call number for volleyball (GV1017 V6) would retrieve first works on other specific minor ball games (GV1017), then polo (GV1010-1011), and no amount of truncation would broaden the search to general works on ball games (GV861). Despite its deceptively more theoretical appearance, truncation of Dewey numbers is even less successful than shortening LC numbers.<sup>24</sup> Satisfactory per-

formance of a subject search using truncated class numbers from either LC or Dewey would require at least a copy of the schedule, and would be greatly assisted by a basic understanding of the structure of the classification scheme

#### *Inconsistency of character strings*

An area in which Dewey numbers might seem to have special advantages in machine searching is in the consistent use of certain strings of characters to denote particular concepts. Unfortunately, although a certain amount of correspondence does exist within the system, it does not hold constant throughout the schedules. For instance, while the 300s do house the social sciences, and persons occupied with the social sciences are denoted with numbers beginning with 3 in Table 7 (Persons), "3s" are used for parts of the Ancient World in Table 2 (Areas), and for Nordic Peoples in Table 5 (Racial, Ethnic, National Groups). The combination 012 is used to indicate classification of philosophy in Tables 1 and 3, but "nonaborigines" in Table 5. LC classification schedules have much less correspondence than Dewey, and notation conventions that may hold constant in a particular class (in G, for example, numbers with a fourth digit of 4 or 9 indicate a city or part of a city, while numbers whose fourth digit is 2 or 7 are for geographic regions or features) are not necessarily repeated in any other schedule or class. While such noncorrespondence of character combinations does not preclude successful class number searching any more than textual searching is precluded by disparately spelled synonyms, it does not constitute any particular advantage of classification searching over subject term searching.

*Searchability of numbers* Computer technology has made substantial advances since libraries started using it, and operations that can be performed affordably and seemingly instantaneously by machines within the reach of individual libraries today would have placed significant burdens on some of the largest computers of the early 1960s. In the milieu of older, less competent and more expensive computing machines, exploration of means of information retrieval via terms such as class numbers that employ a limited character set seemed imperative. While it is still true that a computer can more easily perform searches on a restricted list of symbols than it can on the entire ALA

character set, the advantage of numbers is not nearly so great as it used to be, and the need to devise an acceptable computer searching method using numbers has lost its urgency.

#### **Proposals for Action**

The limitations enumerated above have not gone unnoticed by the proponents of online catalog access via class number, but the view of visionaries is apt to be long, and supporters have made a number of suggestions for actions that would increase the likelihood and effectiveness of class number retrieval in the future.

A first priority for many is making the major classification systems available in machine-readable form, and relating them to each other, to their own previous editions, and to the commonly used subject heading lists.<sup>25</sup> If such data

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is to be useful to online catalog users, however, it needs to be incorporated into those catalogs, and for this to be possible, a MARC or MARC-like authorities format for classification numbers needs to be devised. Neither the creation of such a format, nor the intellectual coordination of classification numbers, nor the input of data is a matter of a few months' work. A major commitment of funds and staff would be required for original creation of the structure, as well as for its continued upkeep. Incorporation of the resultant data into the online catalog would also pose significant programming challenges.

Another proposal is that there be a differentiation between the use of classification numbers in shelf arrangement and their use as subject retrieval devices, and that numbers be assigned for both purposes. In addition to the finer subject analysis that multiple class numbers

would make possible,<sup>26</sup> other reasons for making a distinction between shelf and catalog access include the increasing amounts of materials which may be available only through online retrieval systems, and which therefore do not constitute shelving problems.<sup>27</sup> The multiplicity of media in which information is being disseminated makes classified intershelving a practical impossibility and makes retrieval systems such as the online catalog the only remaining tools for classified access.<sup>28</sup> In fact, browsing the online catalog via call number as an alternative to browsing the shelves seems likely to become almost as much an assumed part of the future of catalog access<sup>29</sup> as Boolean operators have become. But like the siren of Boolean searching, which is widely listened to by designers, but is so far not all that heavily or well used, call number browsing is not necessarily easily implemented, it is not without costs, and it may not be easy to use.<sup>30</sup> At the most basic level, despite the fact that some suggestions for revisions in MARC fields to enhance classification retrieval have begun to be seen, accommodation of extra class numbers would require alterations in the bibliographic formats, and such alterations are generally neither easily nor speedily made.<sup>31</sup>

#### **Conclusion**

It is likely that most online catalog designers could bring up some semblance of call number or even classification access relatively soon if the demand for the service were great enough, but it has been seen that mere ability to retrieve an item by its call number has limited usefulness, and unless the problems of past practice, format hospitality, shortage of staff, etc. can be overcome, even the ability to browse the shelflist will have restricted applications. Although Cochrane and others urge that libraries not get "bogged down by the idiosyncracies of our present systems",<sup>32</sup> the future of classification access must take into account not only present and past systems and practices, but also libraries' ability to alter them. No matter how willing catalogers might be to provide enhanced subject access through better, and possibly multiple classification numbers, only so much work can be accommodated by existing staff, and no matter how well new class numbers are assigned, the problems of older records will still need to be acknowledged. Some problems, such as

the connection of related, though obsolete or "extra-systemic" numbers may be solvable, although at considerable expense, through creation of machine-readable and interrelated classification schemes, and their incorporation into bibliographic databases. Others, such as unrigorous assignment of class numbers, or blind acceptance of numbers assigned by others, may simply have to be lived with.

The automation of library processes and catalogs has developed at an astonishing rate in the last two decades, and with a success record that could lead an optimist to believe that anything is possible. But workable and generally accepted standards for online catalog access to textual entry fields such as authors, titles, and subjects are still far from settled at the national, library, or system level. Given the expense and time that may be involved in completing work on this type of access for which the demand is clear, and whose usefulness is not subject to question, it must be asked if the diversion of attention and funds to online classification searching is wise. The need for it is not so well established, and its ultimate success is so dependent on major expenditures, realignment of cataloging practices and policies, and alteration in staffing patterns.

A minimum requirement for an online catalog is that it afford at least as good access to information as the card catalog. Online subject searching by classification number would offer an approach to information well beyond the capabilities of card catalogs, and it is undoubtedly worth aiming for. Providing this avenue of access should form a part of our long-term speculations and plans, but it presents complex problems

of programming, funding, bibliographic instruction, and more. Quick solutions will not be complete. Complete solutions will not be inexpensive. Online classification access belongs on our priority list, but not yet at the top.

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- <sup>4</sup>Paul S Dunkin, *Cataloging U S A* (Chicago: ALA, c1969), p 124
- <sup>5</sup>Maltby, p 121
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- <sup>7</sup>A C Foskett, *The Subject Approach to Information*, 4th ed (Hamden, CT: Linnet Books, 1982), p 409
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- <sup>9</sup>Ingetraut Dahlberg, "Major Developments in Classification" in *Advances in Librarianship*, v 7, ed Michael Harris (New York: Academic Press, 1977), p 73
- <sup>10</sup>Ibid, p 59
- <sup>11</sup>Charles R Hildreth, *Online Public Access Catalogs: The User Interface* (Dublin, OH: OCLC, c1982), p 131
- <sup>12</sup>Dahlberg, p 76
- <sup>13</sup>In this paper, a distinction is made between access via class number—that is, via the segment of the call number that has subject significance, and access via the entire call number
- <sup>14</sup>*Subject Access Report of a Meeting Sponsored by the Council on Library Resources, Dublin, Ohio, June 7-9, 1982*, compiled and edited by Keith W Russell (Washington: CLR, 1982), pp 34-39, 59-60
- <sup>15</sup>That is, subject analysis represented by symbols rather than by words

<sup>16</sup>Dunkin, p 109

<sup>17</sup>Dahlberg, p 78

<sup>18</sup>Grace Kelley, *The Classification of Books: An Enquiry into its Usefulness to the Reader* (New York: H W Wilson, 1937)

<sup>19</sup>Dunkin, p 18

<sup>20</sup>Michael Gorman, "The Longer the Number, the Shorter the Spine," *American Libraries* 12 (September 1981) 499

<sup>21</sup>Library of Congress Subject Cataloging Division "PRECIS Project" (January, 1978) Mimeographed p 5

<sup>22</sup>Emma Lathen, *Ashes to Ashes*, (New York: Pocket Books, c1971), p 89

<sup>23</sup>Gorman, p 498

<sup>24</sup>Dahlberg, p 78

<sup>25</sup>Pauline Cochrane, "Classification as an Online Subject Access Tool: Challenges and Opportunity," in *Subject Access Report of a Meeting Sponsored by the Council on Library Resources, Dublin, Ohio, June 7-9, 1982* Compiled and edited by Keith W Russell (Washington: CLR, 1982), p 36

<sup>26</sup>Gorman, p 489

<sup>27</sup>Nancy J Williamson, "Is there a Catalog in your future? Access to Information in the Year 2006" *Library Resources & Technical Services* 26 (2) (April/June 1982) 133

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<sup>29</sup>Elaine Svenonius, "Use of Classification in Online Retrieval," *Library Resources & Technical Services*, 27 (1) (January/March 1983) 79

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<sup>31</sup>Arnold S Wajenberg, "MARC Coding of DDC for Subject Retrieval" *Information Technology and Libraries* 2 (3) (January/March 1983) 246-251

<sup>32</sup>Cochrane, p 39

