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Cutter's Procedure for Specific Subject Indexing
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[Cutter's procedure of deriving subject headings for syndetic specific subject indexing in a dictionary catalogue is a specific content of the logical form abstracted in the general theory of subject headings. This can be recognised through the interpretation of the abstract logical form. For this purpose an attempt is made to understand precisely the denotations of the pertinent technical terms used by Cutter in relation to subject indexing. The special attributes of the dictionary catalogue envisaged by Cutter are culled out from his various discussions; and they are systematised. Developments in subject headings that took place prior to Cutter are taken note of with reference to the general theory of subject headings. The study of fundamentals of Cutter's procedure as a whole, in this context, reveals that his policy for asyndetic subject indexing consists of associative grouping (classification) deeming each specific subject — individual or general, as the case may be — as a base. In the case of a compound subject, all other components, if any, are the complements. His policy for syndetic subject indexing also consists of the same associative grouping. Additionally it consists of introducing an approximation to organising grouping (classification) through references without explicit indications of COSSCO-relationships. His explicit rules of procedure are meant for implementing these policies. Evidently, there is an implicit set of postulates about the elementary structures of names of subject, which is distilled out. That there is an implicit systematic scheme of subject headings which becomes evident from Cutter's discussion and examples, is also pointed out. The application of Cutter's basic rules on the basis of the modulated names-of-subject formulated by using the postulates and the implied scheme, is demonstrated].

Abbreviation used:

RDC = Rules for a dictionary catalog; by Charles A. Cutter. Ed 4. 1904.

Note.— Every quotation in this paper is from RDC.

0 Introduction**01 LOGICAL APPROACH**

Philosophical logic applies to every subject. It is primarily concerned with forms, their manifestations, and their transformations. The notion of form, in this context, is highly general; and it is distinguished as Logical Form. In the most general sense, logical form essentially refers to Structure. Structure denotes the interrelationships of the parts or non-wholes of entities deemed to be wholes; in other words, the way in which the parts are put together. In this context, parts need not necessarily be deliberately put together by somebody. Logical forms may be preconceived, natural, or accidental. Orderliness is characteristic to logical forms. The notion of System becomes operative when the notion of logical form is conceded. The logical form of an entity is quite distinct from its Content—the medium wherein a form is expressed. One and the same logical form may be exemplified by different contents. Again, one and the same content may appear in several forms. Different entities exemplifying a common logical form are Analogous. One entity can represent another only by Analogy, even if they do not resemble each other. Abstraction consists of the consideration of a common logical form exemplified by several analogous entities, without any reference to their contents. Concepts are abstracted logical forms. Interpretation is a process of finding contents for concepts.

Logical approach consists of the application of philosophical logic to a subject. It aims at (a) finding many logical forms for a given content; (b) abstracting a common logical form from diverse contents to formulate concepts; and (c) interpreting known concepts. Essentially, abstraction and interpretation are the two ways by which new Patterns are discovered. Models result out of interpretation; and each model is an Instance of interpreted logical form. Logical approach throws light on obscure problems, unifies notions, ensures systematisation, reveals inconsistencies in thoughts, and suggests generalisation of ideas seemed to be specific in their application. (3).

02 GENERAL THEORY OF SUBJECT HEADINGS

According to the essence of the general theory of subject headings, the work of deriving subject headings and the work of classifying have their common foundation in the classification of the universe of subjects. Classification of subjects is always purpose-oriented. As a process, it essentially consists of recognising groups of subjects to suit the purpose in hand. The term 'Group', in this context, essentially refers to an assemblage of subjects regarded as a unit because of their comparative segregation from others

based on a common characteristic relevant to the purpose in hand. When the groups are made to relate hierarchically, it is a product of "Organising Classification". Organising classification aims to establish "Coordinate-Superordinate-Subordinate-Col-lateral Relationships" (COSSCO-Relationships) among subjects. Non-hierarchical groups are the product of "Associative Classification". Organising classification is based on the recognition of structures (logical forms) of subjects. For this purpose, structures require to be recognised in two dimensions: (a) the dimension of the comprehensiveness of groups (which in the verbal plane becomes the dimension of the denotation of the term-correlates of groups); and (b) the dimension of the elementary constituents taking part in the formation of the coextensive term-correlates of groups, and their interrelationships. The former may be referred to as "Semantic Structure"; and the latter as "Elementary Structure". A coextensive name-of-subject in any natural language is not readily suggestive of its COSSCO-relationships. According to a coherent set of postulates relating to the elementary structure (elementary constituents and their interrelationships) of names-of-subject, it can be translated and transformed into an "Artificial Verbal Language" to make it readily suggestive of its COSSCO-relationships. Generally, the purpose oriented elementary constituents of coextensive names-of-subjects can be categorised into two groups: (a) Base; and (b) Complement. When the purpose is to make all the subjects relating to a particular elementary constituent into a group, the elementary constituent concerned is recognised as a base. A complement may consist of a "Modifier" of an idea or idea-complex deemed to be a base, or a non-whole of a base not warranting to be deemed to be a base for the purpose in hand. A modifier reduces the extension of a subject without affecting the conceptual wholeness of its idea-correlate. A complement may also consist of an idea deemed to be a "Non-whole" of a recognised base. Such a non-whole may consist of an idea falling within the purview of the "Core" of the base concerned; or it may be an idea denoting an "Attribute" (property or function) of such a core-entity; or it may be an idea denoting an "Action" performed on such a core-entity or on any of its attributes. Such a complement is neither formed by explicit or implicit association of a modifier with the base concerned; nor does it warrant to be recognised as a base for the purpose in hand. A modified base is a "Compound Base". A modified non-whole complement is a "Compound Complement". A coextensive name-of-subject in an artificial verbal language augmented by introducing the superordinates of the base and of the complements is a "Modulated Name-of-Subject". To be fully equipped to serve all purposes of subject indexing a modulated name-of-subject is to take note of all possible synonyms at each point of modulation. The process of arriving at a modulated name-of-subject through the recognition of the semantic structure and

the elementary structure of the name of subject in a natural language may be denoted by the term "Sem-syntactic Analysis". (Semantic cum Syntactic Analysis) (1). A modulated name-of-subject is the horizontal version of a "Chain" resulting out of organising classification. A modulated name-of-subject can be further translated into an artificial language of ordinal numbers called "Notational Language" to mechanise the determination of COSSCO-relationships. At each stage, it is a name of subject. When it is used or intended to be used as a search-name it becomes a "Subject Heading." The form of modulated name-of-subject is readily amenable to transformation for creating groups of associative classification. Thus the results of organising classification can serve as the source of deriving mechanically the results of associative classification; while the opposite process can never be reduced into a mechanical job. The foundation of any rational associative classification can be traced into an organising classification—explicit or implicit. In serving the whole purpose of subject headings, organising classification and associative classification are complementary to each other. (2).

03 SCOPE OF THE PAPER

The general theory of subject headings is a product of the logical approach towards the foundations of the outstanding procedures of deriving subject headings. This is a specific example of abstraction. Its aim has been to extract the knowledge of the common logical form from its contents and to render it explicit. A system of subject headings constitute an artificial language to express names-of-subject. It is designed for organising grouping and/or associative grouping of related subjects through widely understandable mechanical arrangement with the idea of finding those names expeditiously when the need arises. The foundation of this artificial language is the system of coextensive names-of-subject in natural languages. Each subject heading is a sentence in its artificial language. Understanding of a sentence calls for knowledge both of the constituents and of the particular instance of the logical form. The abstract theory considers primarily the logical form which several analogous artificial languages of subject headings have in common, apart from their respective contents. It may be regarded as an empty logical form. The systems of class numbers, and the systems of verbal subject headings are all its different contents—recognisable through interpretations. In a sense, each system of verbal subject headings may be taken as a specific content of the empty logical form, recognisable through the interpretation of the abstracted general theory. Each system while conforms to the logical form may differ from others in specific relational elements of its structure. Charles A Cutter's procedure of deriving subject headings for syndetic specific subject indexing in a dictionary catalogue is a specific content of the logical form abstracted in the general theory of subject headings. This can be recognised through the interpreta-

tion of the abstract logical form. An attempt is made in this paper to substantiate this proposition.

1 Cutter's Technical Terminology

11 NEED

"There is such confusion in the use of terms in the various prefaces to catalogs—a confusion that at once springs from and leads to confusion of thought and practice—that it is worth while to propose a systematic nomenclature." Cutter has introduced his "Definitions" of technical terms in RDC with these words; his is the pioneering attempt in this direction. To avoid confusion in understanding the theoretical foundation of Cutter's procedure of deriving subject headings, it is essential to take note of the precise denotations of some of the pertinent technical terms. The technical terminology developed by Cutter applies predominantly to the universe of documents. The discussion below turns on these terms. It is interpretative in nature; and it has been systematised to suit the purpose in hand. But, as far as practicable, it is presented in Cutter's own words.

12 SUBJECT

According to Cutter, Subject is "the theme or themes of the book whether stated in the title or not". The term 'Theme' is generally defined as the subject or topic on which one speaks or writes. The above definition of the term 'Subject' does not appear to be adequate to understand the sense in which Cutter has used it. Interpretatively, Cutter has used the term 'Subject' as a generic term to denote (a) Individual-Subject; and (b) General Subject. The denotations of these terms, as given by him, are predominantly through enumeration; and they are scattered. Definitions such as the following can be formulated by collecting them together and by interpreting their intentions. Individual Subject refers to the theme of the book consisting of an idea denoting an individual; for example, Goethe, Shakespeare, John Milton, Warrior Iron-clad, Mt Jefferson, England, Middle Ages, the ship Alexandra, the dog Tray, the French Revolution, etc.; all of which are concrete. General Subject refers to the theme of the book consisting of an idea-complex admitting of analysis into two or more component idea-complexes or individual subjects; for example, Man, History, Mathematics, Philosophy, Horses or Hippology, Animals or Zoology, Plants or Botany, etc, which may be either concrete or abstract. The individual horses—such as, Lady Suffolk, and Justin Morgan are individual subjects. Shetland Ponies, Arabian Coursers, and Barbs admit of ultimate analysis into individual horses; and therefore, they are all general subjects. Further, Horses or Hippology admits of analysis into individual horses; and therefore, Horses or Hippology is a general subject of higher remove.

13 FORM

Interpretatively, Cutter has deemed the term

'Form' to be a generic term denoting (a) Practical Form, and (b) Literary Form. The denotations of these two terms, as given by him are again through enumeration. Practical Form refers to the form of presentation used in Almanacs, Dictionaries, Encyclopaedias, Gazetters, Indexes, Tables, etc. Literary form refers to the form denoted by each of the terms — such as, Fiction, Plays, Comedies, Farces, Tragedies, Poetry, Letters, Orations, Sermons, etc. and the terms denoting their respective subdivisions, for example, the subdivisions of Sermons — such as, Charity, Election, Funeral, Installation, Ordination, Thanks giving etc.

14 CLASS

According to Cutter, Class is "a collection of objects having characteristics in common". In the context of the universe of documents the term 'Class' denotes specifically a collection of documents having characteristics in common. For the purpose of forming classes of documents, any characteristic of documents can be considered; for example, size, binding, publisher, language, donor, original owner, readership, subject, form, etc. To form classes for the purpose of document-service in libraries, the characteristics 'Subject' and 'Form' are most important. The classes of documents formed on the basis of the characteristic 'Subject' are Subject-Classes. The classes of documents formed on the basis of the characteristic 'Form' are Form-Classes. The classes formed on the basis of the combination of the Characteristics 'Subject' and 'Form' are Subject *cum* Form-Classes; for example, Encyclopaedia. Interpretatively therefore, in the context of the universe of documents, the term 'Class' may be deemed to be a generic term denoting Subject-Class, Form-Class, and Subject *cum* Form Class.

15 SUBJECT-CLASS RELATIONSHIP

The definitions of the terms 'Subject' and 'Class' as given by Cutter, may lead to some confusion about their mutual relationship. Cutter has resolved this confusion. According to him, "Subject is the matter on which the author is seeking to give, or the reader to obtain information; Class is a grouping of subjects which have characteristics in common. A little reflection will show that the words so used partially overlap, the general subjects being classes, and the classes being subjects, but the individual subjects never being classes. It might be said for example, that Geology as a *proof of revelation* would have for its subject Geology, but for its class Theology — which is true, not because Class and Subject are incompatible, but because this book has two subjects, the first Geology, the second one of the evidences of revealed religion, wherefore, as the Evidences are a subdivision of Theology, the book belongs under that as a subject-class. It is plain enough that Mt Jefferson, John Milton, Warrior Iron-clad etc are not classes. Countries, however, which for most purposes it is con-

venient to consider as individual, are in certain aspects classes; when by the word 'England we mean the English it is the name of a class'.

16 ENTRY AND HEADING

According to Cutter, an Entry is a "registry of a book in the catalog with its title and imprint". The term 'Registry' appears to have been used to denote both recording and record. The imprint, according to Cutter, consists of "place of publication, publisher's name, date, number of volumes, number of pages, number of maps, engravings, and the like, and typographic form". The concepts of Short, Medium, and Full have been introduced by Cutter himself. Relating to the inclusion of the imprint in the entry, Cutter's comments are "Inprints are indispensable in a catalogue designed for scholars, that is, for college libraries, for historical or scientific libraries, and for large city libraries. They may not be of much use to nine persons in ten who use those libraries, but they should be inserted for the tenth person. But in the majority of popular city and town libraries, neither the character of the readers, nor of the books justifies their insertion". Obviously therefore, imprint is not an essential attribute of an entry.

A "reference from one subject to another" is a Cross Reference. A record referring from one subject to another is not called a reference entry by Cutter. Interpretatively, cross reference refers to the record also. It may also be noted that a reference from a class to a subject or vice versa, or from a class to another class has been regarded as a reference from one subject to another. Obviously, a cross reference is not an entry, according to Cutter. When the reference is not from a subject, it is called a Reference and not a cross reference. Cutter has recognised Subject Reference as a technical term; but it is completely synonymous with cross reference.

Heading is "the word by which the alphabetical place of an entry in the catalogue is determined, usually the name of the author, of the subject, or of the literary or practical form, or a word of the title". The determinant of the alphabetical place of an entry (unit record) need not necessarily be a word in all cases; it may be a word-group also. Further, the word or word-group determining the alphabetical position of a reference is also heading, though not explicitly stated.

"The name of a subject used as a heading under which books relating to that subject are entered" — is a Subject Heading. Cutter has not distinguished class heading from subject heading. Obviously therefore, class heading also is referred to by subject heading.

Specific Entry consists of "registering a book under a heading which expresses its special subject as distinguished from entering it in a class which includes that subject." For example, registering Lady Cust's book on "The cat" under Cat is a case of specific entry. On the contrary, registering it under Zoology, or Mammals, or Domestic Animals is not a

case of specific entry. Specific subject, therefore, is the name which expresses the special subject as distinguished from the class which includes that subject. Evidently, specific entry also refers to a record made under a specific subject.

"Registering a book under the name of its class", is called Class Entry. For Example, registering Lady Cust's book under Zoology, or Mammals, or Domestic Animals is a case of class entry. Evidently, class entry also refers to a record made under a class.

2 Dictionary Catalogue

21 GENERAL DEFINITION

According to Cutter a Dictionary Catalogue is "so called because the headings (author, title, subject, and form) are arranged, like the words in a dictionary, in alphabetical order". This definition may be regarded as quite adequate for ordinary practical purposes. But the dictionary catalogue envisaged by Cutter is characterised by several specific attributes. These attributes primarily pertain to the subject headings to be used in the catalogue. They are claimed to be quite different from those of the subject headings used by the then existing *Classed Catalogues*. The definition, of course, does not give any hints about these distinctive attributes of the dictionary catalogue envisaged by Cutter. Nor these attributes are found systematised in one place. They are scattered in many of his statements in the different parts of RDC. An attempt is made here to systematise them in one place. As far as practicable, it is presented in Cutter's own words.

22 PARTS

In a dictionary catalogue, all the entries, cross references, references, and analyticals are arranged alphabetically. Still, Cutter has found it helpful to recognise parts of a dictionary catalogue. The primary parts recognised by him are the (a) author catalogue; (b) title catalogue; (c) subject catalogue; and (d) form catalogue. This becomes evident from his treatment of these parts separately in RDC.

23 GENERAL DIFFERENCE FROM OTHER CATALOGUES

The whole universe of catalogues has been classified by Cutter first on the basis of the characteristic "mode-of arrangement of entries". On the basis of this characteristic he has distinguished two groups:

- (a) Catalogues based on logical arrangement, which he has called *Systematic Catalogues*; and
- (b) Catalogues based on alphabetical arrangement, which may be called *Alphabetical Catalogues*.

In the next stage, he has chosen the characteristic "kinds of subject entries constituting the catalogue" to distinguish further groups. *Systematic Catalogue* is a generic term denoting *Undivided Classed Catalogue*, and *Subdivided Classed Catalogue*. An undivided classed catalogue consists of class entries. A subdivided classed catalogue consists of class entries, class subentries, and finally specific subentries.

Alphabetical catalogue is a generic term denoting *Alphabetic-Classed Catalogue*, *Dictionary Catalogue*, and other alphabetical catalogues—such as, *Author Catalogue*, *Title Catalogue*, etc. Cutter has distinguished two varieties of the alphabetic-classed catalogue. While one consists of class entries with specific or class subentries; the other consists of class entries with chiefly class subentries. He has not assigned compact names to these varieties. *Dictionary Catalogue* is a generic term denoting *Common Dictionary Catalogue* (which can also be called *Asyndetic Dictionary Catalogue* following Cutter's line of terminology, though he himself has not used it), *Syndetic Dictionary Catalogue*, and *Dictionary Catalogue with Class Entries*. An *asyndetic dictionary catalogue* (common dictionary catalogue) consists only of specific entries without cross references. A *syndetic dictionary catalogue* consists of specific entries and cross references. A dictionary catalogue with class entries consists of specific entries and class entries. The term '*Classed Catalogue*' denotes both systematic catalogue and alphabetic-classed catalogue. It may be noted here that from the last quarter of the fifteenth century alphabetical index to the systematic part of the catalogue, became popular. By the middle of the nineteenth century this feature of the systematic catalogue developed considerably. Evidently, Cutter has not considered this feature in distinguishing the varieties of catalogues. But, his pioneering attempt to categorise the then existing varieties of catalogues is commendable, and it holds good still to-day. Another point may further be taken note of here. The kind of classed catalogue envisaged by Dewey was a remarkable extension of the then known systematic catalogue with many outstanding novel features. But Cutter does not seem to have recognised it as a variety in his RDC. Ranganathan's classified catalogue is a further development of Dewey's classed catalogue with many outstanding novel features. The dictionary catalogues designed by Cutter were all *syndetic*; and his RDC is a code for designing a *syndetic dictionary catalogue*. RDC, of course, can also be used to design an *asyndetic dictionary catalogue*.

24 SPECIFIC ATTRIBUTES

241 Classification and Dictionary Catalogue

Interpretatively, in the context of the universe of documents, Cutter's definition of the term 'Classification' would be collecting or grouping documents having the characteristic Subject and/or the characteristic Form in common. According to Cutter, the term 'Classification by Subject' "can be used in three senses: (1) Bringing books together which treat of the same subject specifically. That is, books which each treat of the whole of the subject and not of a part only. (2) Bringing books together which treat of similar subjects. Or, to express the same thing differently: Bringing subjects together so as to form a class. A catalog so made is called a *classed catalogue*. (3) Bringing classes together so as to form a *system*.

A catalogue so made should be called a systematic catalog. The three steps are then (1) classifying the books to make subject lists; (2) classifying the subject lists to make classes; (3) classifying the classes to make a systematic catalogue". It is the systematic catalogue that advances to the third stage. The alphabetico-classed catalogue does not advance beyond the second stage. The *asyndetic* dictionary catalogue stops in its entries at the first stage. The *syndetic* dictionary catalogue advances in its cross references at the second stage.

242 *Class Entries and Dictionary Catalogue*

An *asyndetic* dictionary catalogue "contains class-headings, inasmuch as it contains the headings of extensive subjects, but under them there is no class entry, only specific entry. The *syndetic* dictionary catalogue, however, recognizes their nature by its cross references, which constitute it in a certain degree an alphabetico-classed (not a systematic) catalogue. Moreover the dictionary catalogue, without ceasing to be one, might, if it were thought worth while (which it certainly is not) not merely give titles under specific headings but repeat them under certain classes or under all classes in ascending series, e.g., not merely have such headings as Rose, Geranium, Fungi, Liliaceae, Phaenogamia, Cryptogamia, but also under Botany include all the titles which appeared under Rose, Geranium, etc.; provided the headings Botany, Cryptogamia, Fungi, etc were arranged alphabetically".

243 *Individual Entry and Dictionary Catalogue*

"Even the classed catalogs often have specific entry. Whenever a book treats of the whole subject of a class, it is specifically entered under that class. A theological encyclopaedia is specifically entered under Theology, and Theology is an unsubordinated class in many systems. The alphabetico-classed catalogs have specific entry in many more cases, because they have many more classes. Professor Ezra Abbot has such headings as Ink, Jure, Lace, Leacher, Lifesavers, Locks, Mortars, Perfumery, Safes, Salt, Smoke, Snow, Varnish, Vitrol. Mr Noyes has scores of similar headings; but, neither of them permits individual entry, which the dictionary catalogue requires. The alphabetico-classed catalog enters a life of Napoleon and a history of England under Biography and History; the dictionary enters them under Napoleon and England. This is the invariable and chief distinction between the two". It may be noted here that Cutter knew that there was in existence at least one alphabetico-classed catalogue which entered biographies under the names of individuals concerned. He has called it a case "destroying the distinction between itself and the dictionary catalog". It is interesting to note that a classed catalogue enriching itself by specific entries, was a case of "destroying distinction". According to the fundamentals of classification and of classed catalogue even at that time any individual also was a class. There was no bar against using the name of

an individual in a classed catalogue as a heading. But, its limitation was in its dependence on a pre-designed scheme of subject headings (scheme for verbal classification). In the absence of a particular heading in the scheme, generally the practice was to choose the appropriate extensive heading occurring in the scheme. An analogous practice has been recommended even by Cutter for the dictionary catalogue envisaged by him. This becomes evident from his following prescription: "There are thousands of possible matters of investigation, some of which are from time to time discussed, but before the catalog can profitably follow its 'specific' rule in regard to them they must attain a certain individuality as objects of inquiry, and be given some sort of name, otherwise we must assign them class entry". In classed catalogues it was not a universal practice. For example, evidently, the classed catalogue referred to by Cutter himself did not enumerate the names of individuals in the pre-designed scheme; because it was simply impracticable. The entry under individual biographies must had been carried out on the basis of a general instruction. In spite of his being aware of this, Cutter is found to have been a bit critical about this issue. On the contrary, an *asyndetic* dictionary catalogue, which appears to be the true dictionary catalogue according to him, "without ceasing to be one" can be a *syndetic* dictionary catalogue by enriching itself with cross references, which again, "without ceasing to be one" can be a dictionary catalogue with class entries. Such an inconsistent consciousness about the principle of purity did not prove helpful. Some of his arguments based on this principle are found to have overshadowed the purpose of the catalogue. It seems that, this sentiment stood in the way of his suggesting improvements of classed catalogue. It is beyond doubt that he was fully aware of the efficiency and effectiveness of classed catalogues. It will be evident from some of his statements quoted later. Perhaps it may be noted here, that Dewey realised that the drawbacks of the classed catalogue were more artificially created than inherent; and it was he who showed effective means to remove them.

244 *Features of Classed Catalogue in Dictionary Catalogue*

"A systematic catalog undertakes to exhibit a scientific arrangement of the books in a library in the belief that it will thus best aid those who would pursue any extensive or thorough study. The dictionary catalog sets out with another object and a different method, but having attained that object—facility of reference—is at liberty to try to secure some of the advantages of classification and system in its own way. Its subject-entries, individual, general, limited, extensive, thrown together without any logical arrangement, in most absurd proximity—Abscess followed by Absenteeism and that by Absolution, Club-foot next to Clubs, and Communism to Communion, while Bibliography and Literary history, Christianity and

Theology are separated by half the length of the catalogue — are a mass of utterly disconnected particles without any relation to one another, each useful in itself but only by itself. But by a well-designed network of cross-references the mob becomes an army, of which each part is capable of assisting many other parts. The effective force of the catalog is immensely increased." A syndetic dictionary catalogue "binds its entries together by means of cross-references so as to form a whole, the references being made from the most comprehensive subject to those of the next lower degree of comprehensiveness, and from each of these to their subordinate subjects, and vice versa. These cross-references correspond to and are a good substitute for the arrangement in a systematic catalog. References are also made in the syndetic catalog to illustrative and coordinate subjects, and, if it is perfect, from specific to general subjects".

"It has been objected that lists of novels, plays, etc. (under names of specific languages) do not suit the genius of the dictionary catalogue. The objection is of no importance if true: if such lists are useful they ought to be given. There is nothing in the dictionary plan which makes them hard to use if inserted."

245 Aspect vs Individual in Dictionary Catalogue

"The rule of specific entry is the main distinction between the dictionary catalogue and the alphabetic-classed. The dictionary catalogue in choosing between a class and an individual prefers the latter. Its object is to show at one view all the sides of each object; the classed catalogue shows together the same side of many objects. New England Ornithology and Ornithology of New England are merely different names of the same specific subject. Entry under Ornithology of New England, though by itself specific entry, is when taken in connection with the entries that would be grouped around it (Ornithology, Ornithology of America, Ornithology of Scotland, etc), in effect class entry; whereas the similar grouping under New England does not make that a class, inasmuch as New England Botany, New England History, New England Ornithology are not parts of New England, but simply the individual New England considered in various aspects."

"The tendency of the dictionary catalogue is towards national classification; that is, in separating what relates to the parts of a subject, as is required by its specific principle, it necessarily brings together all that relates to a country in every aspect, as it would what relates to any other individual."

246 Subclasses in Dictionary Catalogue

In the cases of nouns preceded by adjectives, "in most cases the noun expresses a class, the adjective limits the noun, and makes the name that of a subclass (as International law, Remittent disease, Secret societies, Sumptuary laws, Typhoid fever, Venomous insects, Whig Party, Woolen manufacturers), and to adopt

the noun (the class) as the heading is to violate the fundamental principles of dictionary catalog".

In the cases of nouns preceded by nouns, "each of the nouns in turn may be considered as expressing the more general idea, and the other as limiting it; e.g., we can have various headings for Death considered in different lights, among others as a penalty; and we can have headings of various sorts of penalties, among others death. It is evident that this collection of penalties taken together makes up a class, and therefore, this belongs to a style of entry which the dictionary catalogue is expected to avoid; but the series of headings beginning with the word Death would not make a class, being merely different aspects of the same thing, not different subordinate parts of the same subject".

247 Specificity of the Second Heading in Dictionary Catalogue

"It may be asked (1) why (under names of places) the parts of Natural History are separated and the parts of Language and Literature not; and (2) why we do not divide still more (following out the dictionary plan fully), so as to have divisions like Liliaceae, Cows, Horses. As to (2), in a library catalogue of a million volumes it would no doubt be best to adopt rigidly this specific mode of entry for the larger countries; for a catalog of one or two hundred thousand, arrangement in classes is as well suited to quick reference and avoids the loss of room occasioned by numerous headings. With few books minute division has a very incomplete appearance, specialities occurring only here and there, and most of the titles being those of general works."

25 CUTTER'S ESTIMATE OF THE DICTIONARY CATALOGUE

Evidently, Cutter's all efforts to specify the attributes of the dictionary catalogue throw much light on his estimate of its efficiency and effectiveness. Firstly, he realised that the then existing classed catalogues were largely incapable of responding to queries relating to individual subjects, but certainly not relating to specific subjects as a whole. He knew that it was not an inherent defect of the classed catalogue; on the contrary, it was largely due to its dependence on a predesigned scheme of subject headings, which in most cases was inadequately developed. At least one example which demonstrated a line of approach to rectify this defect was known to him. The significance of this line of approach was enormous. For some reason or other its significance was missed. Perhaps undue emphasis on the principle of purity by Cutter was largely responsible for this. Otherwise, as that juncture, some explicit suggestion to supplement the classed catalogue with individual entries as one of the alternatives was quite expected from the genius of Cutter. But, his criticism of the classed catalogue, together with his principles of individual entries can be regarded as an indirect suggestion for such an alternative. Dewey however, during the same time

discovered the root of inefficiency of the classed catalogue and made a remarkable attempt to rectify them.

Cutter emphasised that the objective of the dictionary catalogue was quite distinct from that of the classed catalogue; and that its efficiency and effectiveness should not be measured by using the criteria used for the classed catalogue. Evidently, he did not regard the dictionary catalogue as a true substitute of the classed catalogue so far as the whole purpose of the catalogue was concerned. On the contrary, according to his estimate, the dictionary catalogue could be so designed that it could assure some of the advantages of the classed catalogue, but never all the advantages. Further, he realised that the means of assuring those advantages was quite complex, and naturally less efficient and effective than that used by the classed catalogue.

3 Developments Prior to Cutter

31 FAILURE OF THE CLASSED CATALOGUE

It has been mentioned earlier that one of the substantial points of criticism raised against the different varieties of the classed catalogue was its failure in the majority of cases to respond to specific subject queries. The term 'Specific Subject' was used to denote either an individual subject, or a general subject specifically on which the author seeks to give and the reader to obtain information. The schemes of subject headings (schemes for verbal classification) used as the basis for designing any variety of classed catalogue — systematic or alphabetic-classed — were not adequately developed to take care of individual subjects and general specific subjects of comparatively greater intention. This was the reason for the failure of the classed catalogue to respond to specific subject queries. For example, a book on Iron was to be entered in a classed catalogue under Metals or Metallurgy, if the scheme used did not provide the name of the specific subject Iron in it. Similarly, the life of Napoleon, and a history of England were to be entered under Biography, and History respectively, in the absence of any instruction to prepare individual entries. Naturally, there was no means of responding to the specific subject query for Iron, Napoleon, or England.

32 REMEDY TO THE FAILURE OF THE CLASSED CATALOGUE

To overcome this difficulty, two distinct approaches were made. The advocates of the classed catalogue went on expanding the schemes of subject headings as adequately as practicable by using the principle of literary warrant. The efforts of Ezra Abbott and Noyes in this direction were commendable. The advocates of the dictionary catalogue went on formulating ground rules for deriving subject headings for specific subjects. The developments in this line took place in two stages. Initially, the derivation of specific subject headings was made to be based primarily upon the terminology of the title page of the document catalogued. Panizzi and Edwards were the

advocates of this practice. In the next stage, the derivation of subject headings for specific subjects was made to conform, as far as practicable, to some general system. Watt and Jewett were the advocates of this practice. Dependence on the title page terminology alone was not found conducive to the development of the general system. But no such explicitly stated general system developed before Cutter entered into the field.

33 GROWING POPULARITY OF THE DICTIONARY CATALOGUE

It may be noted here that the emphasis in the field of subject headings largely shifted to the derivation of specific subject headings during the end of the 19th century. At that time, the difficulty experienced by users in consulting any variety of the classed catalogue, together with its failure to respond to specific subject queries contributed to the popularity of the dictionary catalogue. Further, it appears that the majority of the advocates of the classed catalogue were not even prepared to think of a means of making up for the inadequacy of the classed catalogue by supplementing it with individual entries and other necessary specific entries derived freely beyond the scheme used. Of course, they were prepared to expand their scheme and to adopt alphabetisation for arranging the entries to ensure easy consultation of systematic catalogue by users; but not to release the classed catalogue from the bondage of the predesigned scheme, so far as the individual and unprovided for specific entries were concerned. As a result, in some quarters, the dependence on a predesigned scheme of subject headings was regarded to be responsible for all the failures of the classed catalogue. That it might be due to the defects of the design of the particular scheme used or due to some inadequate policy of subject indexing was not consciously realised by the advocates of the dictionary catalogue. The advocates of the classed catalogue tried to make up for the deficiency of the schemes by simply expanding them to some extent. For some reason or other, in some quarters, the design of a dictionary catalogue was assumed to be completely free from any obligation of using any predesigned scheme. In addition, perhaps due to the attitude of the advocates of the classed catalogue, the advocates of the dictionary catalogue started believing that the specific entries were the monopoly of the dictionary catalogue. This belief became so firm-rooted that at a later period even a person like Cutter did not hesitate to argue that "This rule of specific entry is the main distinction between the dictionary catalog and the alphabetic-classed." This he did in spite of his knowing well that a classed catalogue also could adopt the rule of specific entry without difficulty. According to him, that would be possible by "destroying the distinction between itself, and the dictionary catalogue"; so deep was the influence of this belief. Again, in some quarters, the belief in regard to the freedom in deriving subject

headings for the dictionary catalogue became the source of assurance that this was the solution to the problems associated with all possible subject approaches. Of course, Cutter did not contribute to this belief. But this second belief was responsible for the development of a narrow view about the role of a predesigned scheme for classification in the catalogue. Deeper thinking and experience gradually revealed that the work relating to the derivation of subject headings was in fact a specific version of the work of classification; and that it was always helpful to use a scheme for classification for the derivation of subject headings. Cutter realised it; and his procedure of deriving subject headings for a syndetic dictionary catalogue is a manifestation of this realisation.

4 Fundamentals of Cutters' Procedure

41 CUTTER'S POLICY FOR SUBJECT INDEXING

Cutter's policy for asyndetic subject indexing consists of associative grouping (classification) deeming each specific subject—individual or general, as the case may be—as a base. In the case of a compound subject, all other components, if any, are the complements. His policy for syndetic subject indexing also consists of the same associative grouping. Additionally, it consists of introducing an approximation to organising grouping (classification) through referencing without explicit indications of COSSCO-relationships. His rules of procedure are meant for implementing these policies. Cutter's intention appears to be to use the results of the semi-syntactic analyses of names of subjects meant for associative classification as the basis for deriving subject headings for organising classification. According to the general theory of subject headings, it is an extremely difficult task; and it fails to assure consistency in practice. What E W Hulme calls 'immense labour' applies only to a part of this activity, about which Cutter says "My experience disposes me to adhere to the phrase 'immense labor'." The whole body of Cutter's rules consists primarily of the following sets:

1 Rules for associative grouping (classification) in the verbal plane by deeming each specific subject as the base. This set consists primarily of the following rules in RDC: 161, 162, 163, 164, 165, 174, and 175.

2 Rules for introducing an approximation to organising grouping (classification) through referencing without explicit indication of COSSCO-relationships. This set consists of the following rules in RDC: 187 and 188.

3 Rules for controlling synonyms, homonyms, and other linguistic problems. This set consists of the following rules in RDC: 167, 168, 169, 170, 171, 172, and 173.

4 Rules for effective economic measure. This set consists of the following rules in RDC: 166, 176, 177, 178, 179, and 180.

5 Miscellaneous Rules: This set consists of the following rules in RDC: 181, 182, 183, 184, 185, 186.

They are also primarily concerned with the determination of specific subject headings for certain specific kinds of documents—such as, Collections, Civil Actions, Review to, etc.

Rules 174 and 175 seem to be equally concerned with the problems of standardising multiworded names-of-subject.

42 IMPLICATION OF THE BASIC RULES

The following rules in RDC may be considered as the basic rules so far as Cutter's policy of associative grouping (classification) and his policy organising grouping (classification) are concerned:

1 Rule 161: Enter a work under its subject-heading, not under the heading of a class which includes that subject.

2 Rule 187: Make references from general subjects to their various subordinate subjects and also to coordinate and illustrative subjects.

3 Rule 188: Make references occasionally from specific to general subjects.

Obviously, the immediate implication of these basic rules is Cutter's realisation of the significant role of classification—associative and organising—in subject indexing. This can be put as follows: On one side, a specific subject may be related to a general subject of greater extension of which it can be deemed to be a subordinate part; which in turn may have similar relation with another general subject of still greater extension; and so on. On the other side, a specific subject may be related to a general subject or individual subject, as the case may be, of lesser extension forming subordinate part of it; which again may have similar relation with another general subject or individual subject, as the case may be, of still lesser extension; and so on. Besides, there are subjects with coordinate and collateral relationships.

The question is—"How to determine expeditiously which is related to what, and what is the nature of that relationship?" Cutter prescribes a procedure: "The construction of this system may be carried on simultaneously with the ordinary cataloguing of the library, each book as it goes through the cataloger's hands not merely receiving its author and subject-entries, but also suggesting the appropriate cross reference; but when all the books are catalogued the system will not be complete. References are needed not merely to the specific from the general but to the general from the more general and to that from the most general. There must be a pyramid of references, and this can be made only by a final revision after the completion of the cataloguing. The best method is to draw off in a single column a list of all the subject-headings that have been made, to write opposite them their including classes in a second column, and the including classes of these in a third column; then to write these classes as headings to cards and under them the subjects that stood respectively opposite to them in the list, to arrange the cards alphabetically, verify the references, and supplement them by thinking of

all-likely subordinate headings and ascertaining whether they are in the catalogue, and also by considering what an enquirer would like to be told or reminded of if he were looking up the subject under consideration. In this way a reasonably complete list may be made."

The procedure is adoptable only for compiling a frozen catalogue. It cannot be adopted for a growing catalogue. The resulting list is a scheme for verbal classification developed mainly by a pragmatic approach applying mostly the principle of literary warrant to a very limited sample of documents. In fact, it is a specific version of an alphabetical index to a hierarchical (systematic) scheme for verbal classification. In a sense, it is a thesaurus in dictionary form, the foundation of which is a thesaurus in systematic form. Here, the index is generated before that to which it is an index. Experience in designing a scheme for classification including thesaurus confirms that as a methodology, Cutter's procedure by itself is not an effective and productive method.

The main criticism against the classed catalogue is its dependence on a predesigned scheme for verbal classification. Its enrichment by individual entries is regarded as a case of "destroying the distinction." But according to Cutter's prescription, a syndetic dictionary catalogue is to depend heavily on a scheme for classification. Instead of its being predesigned, it is to be mostly postdesigned. The designing of the scheme is to be heavily influenced by the indexing already done by using no tool to control inconsistencies. Naturally, the scheme is to adjust itself with the inconsistencies already committed, instead of the index conforming to a freely designed scheme that can assure consistency in practice. Further, the inter-subjects COSSCO-relationships determined with so much of effort while designing the scheme, is to be sacrificed to a great extent in preparing the cross references of all kinds. At this point we may take note of Cutter's concluding remarks about his own methodology and device to be used to design a syndetic subject index for a dictionary catalogue:

"There are many things that are seldom used, and then perhaps but for an instant, and yet their existence is justified because when wanted they are indispensable, or because they make useful what is otherwise useless: a policy of insurance, life-preservers in a steamer, the index of a book, large parts of the catalogue of a library, among others the cross references. Of such a nature, but much less useful, more easily dispensed with, is a Synoptical Table of subjects. I mention its possibility here; I do not advise its construction, because there is little chance that the result would compensate for the immense labor. Mr. E. W. Hulme in the Library Association record, Nov. 1900, calls this 'immense labor' a 'bogy'. I began such a table for the Catalogue of the Boston Athenæum; but as the Committee, being eager to have done with the printing, voted not to include the table, it was never finished. My experience then disposes me to adhere to the phrase 'immense labor' and my obser-

vation since of the way in which catalogues are used makes me think that little practical utility was lost to the catalog by the Committee's vote. Such a table would be infrequently consulted and it would be incomplete as new headings are continually added to the catalog of a growing library. But what is too much for each catalog to undertake may profitably be done for all catalogs. In a way it was done by the tables and indexes of two well-known systems of classification; the 'Decimal' and the 'Expansive', which offer to the persistent inquirer — the only one who would ever use such a table — an opportunity to push his investigations into every ramification of his subject."

This is Cutter's concluding remarks relating to the syndetic subject index for the dictionary catalogue envisaged by him. There is no doubt about it that it is based on his vast experience. It is interesting to note that the idea of the specific subject index for a dictionary catalogue originated to implement the policy of making it free from its dependence on a predesigned systematic scheme of subject headings (hierarchical scheme for verbal classification) supplemented by an alphabetical index. The need of such a scheme was first felt to ensure consistency in practice in preparing specific subject entries under general subjects of different removes for an syndetic subject index. The pressure of this need being less, no special attention was paid to it. In the next stage, its need was a bit deeply felt to ensure consistency in practice in preparing specific subject entries and the cross references warranted by them for a syndetic subject index. At this stage, this need became unavoidable; and therefore the designing of a scheme was taken up; and it got incorporated within the subject index. The scheme here took the form of a specific version of the alphabetical index to a systematic scheme. To serve the whole purpose of subject indexing, it was found inadequate and incomplete without the systematic part of the scheme. Therefore, the designing of the systematic part of the scheme (Synoptical Table) was taken up. It was found to be a matter of "immense labor". Therefore, the ultimate prescription was to use a predesigned scheme for classification — such as, Decimal Classification and Expansive Classification. Thus, Cutter's vast experience indirectly confirmed that the work of deriving subject headings and the work of classifying had their common foundation in the classification of the universe of subjects; and that it was more helpful to adopt a predesigned systematic scheme supplemented by an alphabetical index for the purpose of deriving subject headings than going for designing such a scheme during the course of subject indexing. The implementation of Cutter's idea of specific subject indexing by adopting a predesigned scheme would require a scheme capable of taking care of all general subjects occurring in documents, supplemented by a methodology of expanding it when the need arises, and an explicit prescription of using names of individual subjects as specific

subject headings in all cases, whether enumerated in the scheme or not. The derivation of subject headings would involve the following steps:

1 Expressing the name of the specific subject (coexistent name of subject) in the natural language.

2 Sem-syntactic analysis of the name of the specific subject in natural language, according to the set of postulates relating to the elementary structure of names of subjects forming the foundation of the design of the scheme adopted. This would result into a name of specific subject in an artificial verbal language suggestive of its COSSCO-relationships through comparison with other specific subjects. This is classifying.

3 Augmenting the name of the specific subject in artificial verbal language by introducing the superordinates of different removes of each of its components with reference to the scheme adopted. This would result into a modulated name-of-subject. It is the horizontal version of a chain. It can be used as a subject heading to introduce organising classification. It can also be used as the basis for deriving subject headings for associative classification. It can further be used as the basis for cross-referencing.

4 Deriving subject headings to achieve the classification needed according to a set of rules of procedure.

The semantic structures of names of subjects as recognised by specialists in different subjects, and the postulates relating to the elementary structures of names of subjects formulated by the classificationist form the foundation of any scheme for classification. Classifying according to a scheme involves sem-syntactic analysis of names of subjects by using the set of postulates used in its designing. Therefore, for classifying, it is necessary to have the scheme and the set of postulates used. The intention behind the postulates gets reflected in the set of rules of procedure used for rendering subject headings.

Cutter's procedure consists of a set of rules of procedure to be used for rendering specific subject headings. It does not give directly the method of determining the specific subject of a document and its general subjects of different removes. They are to be determined by using the postulates about the elementary structures of names of subjects and the scheme designed on their basis. The postulates and the scheme are implied in Cutters's procedure. It is possible to trace back some of the postulates implied in his rules of procedure and discussion on subject headings and classification. To carry out the intention of the three basic rules quoted above it is necessary to have these postulates explicitly stated.

5 Cutter's Postulates

Interpretatively, the postulates mentioned below form the foundation of Cutter's rules of procedure for deriving specific subject headings and cross references for a syndetic dictionary catalogue. They also form the foundation of the scheme for verbal classification (scheme of subject headings) envisaged by him. These

postulates are not explicitly stated; they are implicitly present in his rules and discussion on subject headings and classification in RDC. Here they are all distilled out as far as practicable. In the absence of a conscious attempt for organising classification by Cutter, there are gaps in this implied set of postulates. However, the recognisable ones can be formulated as follows:

1 *Elementary Constituents*:— The elementary constituents in the universe of subjects are

- (a) Individual Ideas; and
- (b) Class-Idea Complexes.

2 *Individual Idea*:— An idea implying a individual is an Individual Idea. For example, Goethe, Shakespeare, John Milton, Warrior Iron-Clad, Mt Jefferson, England, the ship Alexandra, the dog Tray, etc are all denotative of individual ideas. All of these may be deemed to be concrete. Any proper name is denotative of an individual idea. By extension, a period of time, or an event, or an object, having a proper name is denotative of an individual idea; for example, Middle Ages, Victorian era, St Bartholomew's Bay, War of Rozes, Thirty Year's War, French Revolution, Fronde, Pine-tree Shilling, Queen Anne's Farthing, etc.

3 *Class Idea-Complex*:— An idea-complex admitting of analysis into two or more subordinate idea-complexes or individual ideas is a Class-Idea Complex. For example, Man, History, Mathematics, Philosophy, Horses or Hippology, Animals or Zoology, Plants or Botany, Poetry, Drama, Encyclopedia, Table, etc admit of analysis into subordinate idea-complexes. A class idea-complex may be deemed to be either concrete or abstract. (See also Sec 2 of this paper).

4 *Subject*:— "Subject" is a generic term used to denote "Individual Subject", "General Subject", "Simple Subject", "Compound Subject" and "Specific Subject".

5 *Individual Subject*:— The theme of a discourse consisting of an individual idea is an Individual Subject.

6 *General Subject*:— The theme of a discourse consisting of a class idea-complex is a General Subject.

7 *Simple Subject*:— A subject consisting of a single individual subject or of a single general subject is a Simple Subject.

8 *Compound Subject*:— A subject formed out of a combination of two or more subjects of different categories (individual and general) is a Compound Subject. By extension, a combination of a simple subject with a practical form is also deemed to be a compound subject.

9 *Specific Subject*:— The theme of a discourse embedded in a document is its Specific Subject. It may be a simple subject or a compound subject.

10 *Class*:— A collection of subjects or forms having attributes in common is a Class. "Class" is a generic term used to denote "Subject Class" and "Form Class."

11 *Subject Class*:— A class admitting of analysis into two or more subordinate subjects — Individual or general — is a Subject Class. An individual subject is not a class, but always a member of a class. A general subject is always a class.

12 *Form Class*:— A class admitting of analysis into two or more subordinate forms — literary or practical — is a Form Class.

13 *Modulated Name-of-Subject*:— An individual subject forms part of a general subject; a general subject may form part of a more general subject; and so on. A set of subjects in the decreasing sequence of their respective extensions constitute a Modulated Name-of-Subject. A modulated name-of-subject is the horizontal version of a Chain of subjects. Each subject in a chain is a Link. Any specific subject — simple or compound — in its modulated form is the Last Link of the chain to which it belongs. It is also representative of its full chain.

Example:

1 Zoology — (Mammals > Domestic animals > Cats).

2 Metallurgy — (Iron).

3 Chemistry — (Inorganic substances > Iron).

Note:— The symbol '-' (hyphen) is used to represent that the component immediately following it is a Modifier to the Whole subject preceding it; and they together constitute a subject which is a subdivision of the subject modified. The parentheses are used to demarcate each category of modifier. Each modifier is amenable to division. The division of a subject as a whole or of a component may take place directly or through a modifier. The symbol '>' is used to represent that the component following it is comprehended by the component or the whole subject preceding it. In the first modulated name-of-subject, Mammals has modified Zoology to give rise to its subdivision Zoology of Mammals. Domestic Animals is comprehended by Mammals; and it is one of its direct subdivision. This implies that it has also modified Zoology to give rise to the subject Zoology of Domestic Animals which is a subdivision of the subject Zoology of Mammals. The second modulated name of subject represents the subject Metallurgy of Iron. It is also known as Ferrous Metallurgy. A modulated name-of-subject should be aware of all possible synonyms at each point of modulation. This is essential to control synonyms. For this purpose, it becomes necessary to deem cases like 'Agricultural Chemistry' and 'Chemistry, Agricultural' as synonymous; for, both 'Agricultural' and 'Chemistry' have equal potency of being used as points-of-approach. The third modulated name of subject represents the subjects Chemistry, its subdivision Chemistry of Inorganic substances, and its subdivision Chemistry of Iron. "Chemistry of Inorganic Substances" is also known as "Inorganic Chemistry," which is to be deemed as a synonym. It may also be noted that in selecting the superordinates for the above examples no particular scheme for classification has

been used. As far as applicable, Cutter's own line of suggestion as given in RDC has been followed in this regard. The selection of superordinates for a chain may be different depending upon the predesigned systematic scheme of subject headings used. For example, if DDC (Ed 18) is used the modulated name-of-subject mentioned as example 1 above would take the following form: Zoology — (Chordata > Mammalia > Carnivora > Fessipeda > Feloidae > Felidae > Cats). This implies that without a predesigned scheme the determination of the general subjects of different removes would be left to the "judgment" of the cataloguer. About "judgment" of the cataloguer, Cutter himself, on some other occasion, has said "Judgment, that is the prepossessions and accidental associations of the cataloguer and there will be an end to all uniformity". Therefore, to ensure consistency in practice, it is essential to use a predesigned scheme for the derivation of subject headings. Cutter realised it through his own experience and he has suggested its use in his concluding remarks.

14 *Base and Complement*: In a compound subject, there is always a principal component which in that context is recognised to have the greatest extension. The idea behind such a recognition is to bring in arrangement all subjects related to that component together to form a group in organising classification. The principal component of a compound subject is the Base. Any associate component of the base in a compound subject is a Complement. Each of the complements has the function of reducing the extension of the base in succession. Therefore, the power of reducing the extension of the base of any one of the complements is relatively either more or less than any other. The first complement in the sequence is recognised to have the least extension reducing power. The last complement in the sequence is recognised to have the highest extension reducing power. For associative classification, each of the complements may be treated as if it were a base.

15 *Sequence of Base and Complement*: In modulating (formalising) a name of compound subject, the base should be followed by the complements.

16 *Sequence of Complements*: When arranged in the ascending sequence of their respective power of reducing the extension of the base the complements fall in the following sequence:

- 1 Subject Class;
- 2 Literary form-class;
- 3 Individual subject implying
Place,
Time,
Person,
Event, and
Object; and
- 4 Practical Form-class.

In modulating (formalising) a name of compound subject, complements should occur in the ascending sequence of their respective power of reducing the extension of the base.

17 *Basis for Deriving Subject Headings:* Each name of specific subject in the natural language is to be formalised into a modulated name-of-subject. The modulated name of subject would result out of the semsyntactic analysis of the name-of-subject according to the pertinent postulates selected from the set mentioned earlier. The modulated name-of-subject should form the basis for deriving the subject heading for the specific subject, as well as the subject headings for the cross references.

6 Cutter's Rules

The set of postulates mentioned in Sec 5, forms the foundation of Cutters rules of procedure for deriving subject headings. There is also a systematic scheme of subject headings (scheme for verbal classification) implied in his rules of procedure. In the context of the implied set of postulates and the scheme, it is possible to formulate the following rules of procedure by consolidating the intentions of Cutter's basic rules in RDC:

1 *Subject Heading for the Specific Subject:* Ordinarily, the subject heading for the specific subject is to consist of the word or word-group forming the last component of the modulated name-of-subject. If this is not sufficient to specify the specific subject, it is to be made specific by adding the necessary and sufficient number of words or word-groups from the modulated name-of-subject. If the specific subject heading is a homonym it is to be individualised by suitable means. A numerically expressed period of time or a practical form when occurs as the last component of a modulated name-of-subject, it is not ordinarily entitled to be used as the entry element of a specific subject heading; it is to be used only as its last element.

Note.— In a sense, this rule consolidates the intentions of Cutter's rules 161, 162, 163, 164, 165, 174 and 175.

2 *Subject Headings for "See Also" Cross references:* A "see also" cross reference from a comprehensive subject to a subject comprehended by it, is a descending cross reference; and the one having its opposite structure is an ascending cross reference. Ordinarily, each of the words or word-groups implying a general subject in the modulated name-of-subject should constitute the heading of a descending cross reference. Except for the most general subject heading derived from the modulated name-of-subject, every other subject heading derived from it should ordinarily constitute the heading of an ascending cross reference.

Note.— This rule consolidates the intentions of Cutter's rules 187 and 188.

7 Application of Cutter's Rules

The application of Cutter's rules can be made more objective by using the postulates, the implied systematic scheme of subject headings, and the rules mentioned in Sec 5 and 6. The following is a demonstration of the application of Cutter's basic rules,

71 RULE 161

Consider the specific subject of the document *The Cat* by Lady Cust. As revealed by Cutter himself the specific subject of this document in natural language would be "Zoology of the Cat". According to the pertinent postulates the modulated name-of-subject, following Cutters line of suggestion, would be "Zoology—(Mammals > Domestic Animals > Cats)". According to Cutter's Rule 161 (quoted in Sec 42 and the intention of which has been incorporated in Rule 1 mentioned in Sec 6), the subject heading for the specific subject would be "Cat (Zoology)". The justification of this heading is that the specific subject here consists of a treatment of cats from the zoological point of view; and not from all points of view, or from any other specific point of view. Therefore, the heading "Cat" calls for its individualisation on the ground of the probability of its creating a homonym in catalogue entries. Cutter's Rule 173 prescribes careful resolution of homonyms; but does not go to the extent of enumerating all possible means of doing that. A suitable effective means of resolving homonym is to add the necessary and sufficient individualising elements from the modulated name-of-subject. Hints of such use becomes evident in Cutter's own statement "it will not do to confound works on vegetable kingdom with works on vegetables in the sense of kitchen garden plants". However, in this particular case Cutter has suggested the heading "Cat." During Cutter's time, most probably, the literary warrant did not suggest that "Zoology" was necessary for this heading; for, most of the documents on cats embedded treatments from the zoological point of view only. This point would be clear if the subject "Metallurgy of Iron" cited by Cutter is considered along with the subject "Chemistry of Iron". According to the pertinent postulates, the modulated names of subjects, following Cutter's line of suggestion, would be as follows: "Metallurgy—(Iron)" and "Chemistry—(Inorganic Substances > Iron)". Cutter himself has suggested that according to Rule 161 the specific subject heading for the first mentioned modulated name of subject would be "Iron". Obviously, therefore, according to the same rule, the heading for the second would also be "Iron". This would create a homonym. According to Cutter's Rule 173, this homonym is to be resolved. One means of resolving homonym is to add the necessary and sufficient number of individualising elements to the heading. In this case, this can be achieved in the following way: "Iron (Metallurgy)" and "Iron (Chemistry)". This help is extended by the concerned modulated names-of-subject. According to Rule 173, a means of resolving homonym is to select a different heading in place of one of the homonyms. Following this suggestion it is possible to replace "Iron (Metallurgy)" by "Ferrous Metallurgy". In that case, according to Rule 168 a see-reference is to be made under "Iron (Metallurgy)". This shows that if the modulated name-of-subject is aware of the possible synonyms at each stage of modula-

tion, it can serve as the source for deriving the headings for see-references also.

72 RULE 187 AND RULE 188

After deriving the subject heading for the specific subject, the subject headings for cross references (see also) are to be derived. According to Rule 2 given in Sec 6 (Cutter's Rules 187 and 188 quoted in Sec 42) the cross references relating to the specific subject concerned are to be derived from the modulated name-of-subject, and they would be as follows:

1 Set 1

Domestic animals, see also Cat.

Mammals, see also Cat.

Zoology, see also Cat.

Alternative

Domestic animals, see also Cat.

Mammals, see also Domestic animals.

Zoology, see also Mammals.

Note.— In the commentary to Rule 187, Cutter says, "References are needed not merely to the specific from the general, but to the general from the more general and to that from the most general". Again in the definition of "Syndetic" dictionary catalogue, Cutter mentions, "Syndetic, connective, applied to that kind of dictionary catalogue which binds its entries together by means of cross-references so as to form a whole, the references being made from the most comprehensive subject to those of the next lower degree of comprehensiveness, and from each of these to their subordinate subjects, and vice versa." It becomes evident from these statements that Cutter's intention is to give the references in the style shown as the alternative. Further, this alternative style would produce number of entries considerably less than the other.

2 Set 2 (if necessary)

Cat, see also Domestic animals.

Cat, see also Mammals.

Cat, see also Zoology.

Alternative

Cat, see also Domestic animals.

Domestic animals, see also Mammals.

Mammals, see also Zoology.

Note.— It is also evident from the statements quoted above that Cutter's intention is to give such references occasionally if necessary in the style shown as the alternative. In this case also, the style would produce number of entries considerably less than the other.

73 RULE 162 TO RULE 165

Cutter's Rule 162 to Rule 165 may be considered to be the corollaries of his Rule 161. The intentions of these rules are consolidated in Rule 1 given in Sec 6. For the purpose of applying these rules, let the following subjects be considered:

1 Life of Napoleon.

2 War of the Roses.

3 Geology of California.

4 Queen Anne's Farthing.

According to the pertinent postulates, and the implied scheme of subject headings (as far as it is discernible from Cutter's line of analysis), the modulated names-of-subject would be as follows:

1 History — (Europe > France) — (19th Century) > Napoleon.

2 History — (Europe > Great Britain > England) — (15th Century) > War of the Roses.

3 Geology — (USA > California).

4 Numismatics — (Europe > Great Britain > England) > Queen Anne's Farthing.

On the basis of the modulated names of subjects, according to Rule 1 given in Sec 6, the specific subject headings would be as follows:

1 Napoleon.

2 War of the Roses.

3 California, Geology.

4 Queen Anne's Farthing.

The heading 'Napoleon' is quite in conformity with the intention of Cutter's Rule 162. "War of the Roses" conforms to Rule 163 "California, Geology" and "Queen Anne's Farthing" are in conformity with the intention of Rules 164 and 165.

According to Cutter's Rules 187 headings for descending see also cross references are to be derived. According to Rule 2 given in Sec 6 the modulated names-of-subject are to be used as the sources; and they would be as follows:

1 For 'Napoleon'

France, History, 19th Century.

Europe, History, 19th Century.

2 For "War of the Roses"

England, History, 15th Century.

Great Britain, History, 15th Century.

Europe, History, 15th Century.

3 For "California, Geology"

USA, Geology.

Geology.

4 For "Queen Anne's Farthing"

England, Numismatics.

Numismatics.

Note.— It is difficult to formulate an objective prescription relating to the number of subject headings for descending cross references. It is dependent on several variables. Above all there is the "judgment" of the cataloguer. An element of judgment is reflected in the derivation of the headings mentioned above.

According to Cutter's Rule 188, headings for the ascending see also cross references are to be derived. According to Rule 2 given in Sec 6 the modulated names-of-subject are to be used for this purpose; and they may be derived in the way shown in Sec 72. It may be noted that these references are to be prepared occasionally and therefore, it would admit much play of "judgment" of the cataloguer.

74 RULE 174 AND RULE 175

Consider the name-of-subject 'Ancient History'. It can be expressed as 'History of Ancient Period'.

According to the postulates given in Sec 5, the modulated name-of-subject would be as follows: 'History — (Ancient period)'. According to Rule 1 given in Sec 6, the specific subject heading would be Ancient period, History'. The familiar synonym for this heading is Ancient History. For the purpose of controlling these synonyms — that is, for standardising the specific subject heading — the familiar name may be chosen as the specific subject heading and a see-reference can be given from the other if necessary. This would be quite in conformity with the intention of Rules 174 and 175 taken along with Rule 168.

Consider the name-of-subject 'Moral Philosophy'. The modulated name of this subject would be 'Philosophy > Moral Philosophy'. 'Ethics' is the familiar synonym for Moral Philosophy. 'Morals' also is another synonym which may be used to search for the subject. Therefore, 'Ethics' may be regarded as the specific subject heading according to Rule 168; and see-references may be given from others. This would be quite in conformity with the intention of Rules 174 and 175.

Consider the name-of-subject 'Flower Fertilisation'. The modulated name of this subject would be 'Botany > Reproduction > Fertilisation'. The specific subject heading would be 'Fertilisation (Botany)', 'Flower Fertilisation', 'Floral Fertilisation', and 'Fertilisation of Flower' are the different familiar synonyms for this subject. It is possible to give see-references from each of them, if necessary, according to Rule 168. Alternatively, if 'Flower Fertilisation' is considered to be the most familiar to the class of people who would use the catalogue, it may be used as the specific subject heading, and see-references may be given from those deemed to be worthwhile. This would be quite in conformity with the intention of Rules 174 and 175.

The problems raised in Rules 174 and 175 are all amenable to solution through the application of the postulates, and rules given Sec 5 and 6 together with Cutter's Rule 168.

8 Conclusion

For consistency in deriving subject headings, it is essential to have

1 An integrated set of postulates about the elementary structures of names-of-subject;

2 A scheme of subject headings (scheme for classification — notational or verbal) designed in conformity with the set of postulates giving the necessary and sufficient emphasis on the semantic structures of names-of-subject recognised by subject specialists; and

3 A set of rules of procedure for deriving subject headings to respond to different points-of-approach each formulated in conformity with the set of postulates and the scheme of subject headings.

Cutter's rules of procedure are explicitly stated. It is evident from earlier discussion that there is an implicit set of postulates forming the foundation of his rules of procedure. There is also an implicit scheme. Associative grouping by deeming each specific subject as the base is the primary intention of Cutter's rules of procedure. For a syndetic subject index, Cutter intends to introduce organising grouping through referencing. All his intention can be readily implemented through the semi-syntactic analysis of names of specific subjects in the natural language, according to the set of postulates given in Sec 5 and the implied systematic scheme of subject headings. Therefore on one side, Cutter's procedure as a whole with all its implications is one of the earliest outstanding contributions forming the basis of the abstract general theory of subject headings; and on the other, it manifests itself as a specific content of the empty logical form abstracted in the general theory of subject headings.

9 Bibliographical References

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