THE PROBLEMS OF NOTATION AND FACETED CLASSIFICATION

E G Sukhmaneva

A number of characteristics or main requirements of notation in library classification is given:

1. Notation system cannot exist by itself or be primarily independent of the classification system; it should reflect the differences as well as the many-sided relationship between the concepts.

2. The notation should be short and simple.

3. It should be possible to include newly arising concepts without disturbing the general structure of the system, i.e., to ensure the expansibility of the classification system.

In the light of these requirements, it is shown that the notation system of facet classification has advantages over other systems.

Thus the French specialists in classification (Cordonier, de Grolier and others) considered ease in remembering class number as the main criterion. This arises in alphabetic pronunciation of the syllables. Their system is based on the Latin alphabet on French pronunciation. It is true that pronounceability is a useful quality of notation. But phonetics is inconsistent and such a classification cannot be an international one.

The Polish scientist Z. Dobrovolsky (International Institute of Welding at Paris) considers brevity of the class number as the most important quality. His system is accordingly called 'Notational system with short symbols' [1].

The brevity of the class number is achieved in an original manner. If in the common systems the class number for basic concepts has the least number of symbols, then in the Dobrovolsky system the final heading i.e., narrow specialized concepts are represented by single digits and the generalized concepts are represented as derivatives from these minute ones. Thus, if the final headings are represented as a, b, c, d, e then the main heading will have the number a/e or simply ae. Such a notation is based on the assumption that at present the demand for narrow specialized documents exceeds that for documents of a general character. In Dobrovolsky's system there are positive aspects. But on the whole it develops only one quality of a notational system, namely brevity.
One can give an example of a notational system based only on one of the rules of mnemonics. Merta and Toman [2] (Center for Scientific Information, Czechoslovakian Academy of Sciences) worked out a faceted classification with mnemonic features, for verifying the effectiveness of 4 systems of mechanised retrieval. In this system of classification each letter of the class number corresponds to the first letters of the words in the headings. For example J T means journals, technical and so on. But the authors of this system, according to their acknowledgements, could not stick to this principle fully and they had to employ non-mnemonic notation which they represented by apostrophe.

The Requirements of a Notational System in Library Classification

What are the requirements of a notational system of library classification? First, we cannot speak of a notational system without its relationship with the structure of a classification. The basis of any systematisation is the order of the very subject and not of the criterion. In other words symbolisation cannot exist by itself without an organisation of the concepts of the scheme with all their many sided relations. If this is a linear organisation comprehending the law from general to the particular, accordingly we can understand the sequence of construction of the notation. Thus in Decimal Classification a brief class number reflects a more general concept which within itself is subordinated by more minute class numbers of the 2nd, 3rd, etc. stages. If it is a multi-dimensional faceted classification then each element of its class number strictly corresponds to a single concept of one or other facet of a definite category and expresses the logical relations of one concept with others.

The structure of a classification system is the basis according to which the notation both in its main and auxiliary elements are verified. By understanding the structure of a classification system, we understand the principles of construction, of its notation and vice-versa. Secondly, the principal requirement for any notational system is the way relations and differences between concepts are reflected closely and in all their aspects--this requirement is the very substance of a notational system. It has a direct bearing on the fact what form the class numbers will have.

In other words the class numbers can be brief or long, can be read and pronounced easily or with difficulty, one and the same concept in different subjects of the scheme can be represented alike or differently in two places, the class numbers at one stage of division can have the same or different number of symbols etc. The second requirement of a modern notational system is brevity and simplicity. In this connection it may be noted that too much brevity in notation reduces their expressiveness, specially in mechanised retrieval, which leads to retrieval 'noise' i.e. errors in retrieval arising from inaccurate transcription of the notation.

Brevity in its turn depends on the length of the base of notation and on the uniformity of the distribution of symbols between each stage of subdivision. We had referred to one method of achieving brevity in the notational base [1]. The brevity of this base depends as a whole on the total number of symbols used in any system of classification. Letter notations alone or numerical notations alone are logical but they are more unwieldy and are more difficult to remember. A mixed base notation expands the notational base condensing thereby the individual class numbers; it is more easily understandable and more easily retained, but too much expansion of the mixed base notation complicates the system. Thus in the Soviet BBK, the employment of the letters of the Russian alphabet along with numerals has expanded the notational base. Although the class numbers of the system are brief and can be easily memorised; however, the use of letters such as 3.0.4 has complicated its application in Union Republics and foreign countries. At the same time the employment of numerical notation alone in UDC has contracted its notational base which has adversely affected the logical construction of the system and brevity of the class numbers.

One of the essential requirements for a satisfactory notational system is the simplicity of its symbols. One more quality of a notational system, namely, mnemonics forms part of this concept, apart from easy readability and pronounciability. Some authors interpret this concept more widely than easy memorisability because of uniform reflection of related concepts. S.R. Ranganathan and his school have developed a theory of scheduled and non-scheduled mnemonics. Classification systems which are constructed by taking into considera-
tion rules of mnemonics, acquire exceptionally consistent character. "Plans of arrangements" which are introduced in certain sections of BBK and the tables of general and special divisions can serve as an example of mnemonics in this system of classification. But in BBK the mnemonics is elementary and occasional and is introduced only where the classification of the very science force the compilers to reflect general regularity in the structure of the scheme. For example there is a well worked out table of "Plans of Arrangements" for inorganic chemistry according to compounds and common sub-divisions for organic and inorganic chemistry according to the properties and transformations, but neither of these is present in the physical chemistry section. The UDC table is still less consistent in this respect [3].

Third but not least important requirement in a satisfactory notational system is 'flexibility' i.e. the classification system must permit a redistribution of concepts without violation of its structure. In foreign literature this is called "Vitality" [viable, Fr] or "Hospitality" of the notational system. However accurately a classification system reflects state of science, if the notational system does not meet the requirements for possible inclusion of unlimited new concepts, such a system is not long last. It is thought that the span of life of any completely hierarchical classification is not more than 25 to 30 years.

When we consider that the Library of the Academy of Sciences of USSR is planning reclassification according to BBK for 15-20 years, the significance of this requirement of a notational system becomes evident.

The Notation in the Faceted Classification of Dr. Ranganathan

The notation of a faceted classification have certain advantages over other systems. But everything new that Ranganathan introduces is not contrasted with the already existing methods and principles of construction of classification but supplements and develops them. He has adopted the mixed notation for expanding the notational base; the 10 Arabic numerals, 26 capital letters of the Latin alphabet, 24 lower case letters, except i and o, punctuation marks and parentheses. Such a notational base can be employed in many countries where the Latin alphabet is used. Certain drawbacks are the introduction of Greek letters for representing some main divisions which are introduced in some recent editions of Dr. Ranganathan’s classification system [4, 5]. [This has now been abandoned]. This makes the system less acceptable. There are specific symbols for each stage of division. The capital letters are meant for Main Classes and Chronological Division of the first stage, then the lower case letters for common sub-divisions and for the first symbols of chronological divisions of second stage. Narrow special individual concepts in facets are represented by Arabic numerals in all divisions. When the facet formula is strictly observed (P, M, E, S, T), which in this system of classification expresses the structure, the class number brings out sequentially the content of any complex concept.

For example, let it be required to classify the concept "Foreign policy of Britain in Europe in the fifties". In the division V-History, V3 - England, 19-Policy; from the Chronological division we find N5 for the fifties. We get the ultimate class number as V3:19.5.5 [According to the amendments of the reprinted 6th edn (1963), the correct number would be V3:195'N5]. Thus, each category is expressed with its own connecting symbol which regulates the order of arrangement of individual concepts in the class number and shows their synthetic relationships.

In this way each class number in the faceted classification is formed in strict conformity with its structure and this in effect satisfies the first requirement of a satisfactory notational system.

For the sake of simplicity of understanding and remembering symbols in the faceted classification system of Ranganathan, a system of uniformity in the representation of concepts is developed i.e. mnemonics is strictly maintained in the notational system:

(a) Uniformity is achieved by employing tables of common subject divisions such as general, geographical, chronological and language.

(b) For a single concept of a given class, the class number is given only once in one facet and afterwards it can be used in this class in any combination.
PROBLEMS OF NOTATION AND FACETED CLASSIFICATION

(c) These class numbers which are worked out in the preferred classes are used in all related classes also; for example, the schedules of chemistry is valid for chemical technology and selectively for mineralogy, mining etc. Thus Zirconium in all places of classification is represented by the number 144.

(d) When the facets of the main class do not fit in fully, they are used selectively to represent allied sciences or subjects.

Mnemonics in Ranganathan's system is achieved not only by the uniformity of symbols for related concepts but also by other means of analogy in relation to meaning expressed in the notation. For example according to the Principle of Increasing Quantity, differential equations in the division of Mathematics are specially divided in the following way:

Linear, Quadratic, Cubic, Quartic, etc.

In inorganic chemistry according to this very same principle, groups of elements receive class numbers in the increasing order of valency. In Ranganathan's classification system there exists a sequence in the notation according to the Principle of Later-in-Evolution. For example, in Biology the concepts have the following order: Embryo B; Child C; Adolescent D; and Old age E; etc. According to the Principle of "Bottom Upwards", the following sequence in the notation is achieved in Civil Engineering: Earth Work, Foundation, Floor, Support, Stair and Roof. Still many other examples of the principles of mnemonics of Ranganathan's notation system can be given. No concept is repeated at any place in Ranganathan's classification system. This permits to compress the entire universe of subjects, which is capable of reflecting very narrow concepts, and print it in only 100 pages. Such a compact table is very easy to work with and the class numbers remembered without difficulty. All these meet the second requirement of a satisfactory notational system.

The value of facet classification lies in the fact that it permits to classify very minute subjects. To achieve such a degree of minuteness, for example by UDC, a very lengthy class number will be required. Any specialist in classification knows well that if in the main sequence of traditional classification system, there is no place for a newly developed subject, the class number for it can be constructed by applying special subject divisions or by relating one concept to another. Such a class number will find a place within the general system without violating the general structure. Let us now suppose that a classification system is constructed out of the basic concepts, where each major division of classification consists of schedule of individual terms with corresponding class number for each term. The classifier in that case will not seek the entire subject in the schedule in order to classify a document, but will merely break the subject into basic concepts and select from the tables of isolates the corresponding class numbers and combine them in a strict order with the help of the symbols. This synthesised class number for the document freely fits into the general scheme.

Thus the very structure of the classification system enables a free inclusion of class numbers for a large number of newly developed subjects. In this respect faceted classification has a weak hierarchy. But in Ranganathan's classification system the schedule for individual terms are built within a logical sequence according to the decimal principle and here, as in any other traditional system, there can be difficulties with the appearance of new concepts. In order to avoid them, Ranganathan developed the principle of "Octave Device" [now called Sector Device] which is as follows:-

If it is necessary to accommodate in any one array ten divisions with nine digits (0 is not taken into account) only 8 (Octave) of them are taken in the following order. In the first such divisions: 1, 2, 3, 8, 91, 92, 93, . . . 98, 991, 992, 993, . . . 998 etc., till infinity. In the second such divisions 11, 12, 13, . . . 18, 191, 192, 193, . . . 198 etc., till infinity. Each group of such 8 divisions is called an Octave. This principle of notation easily allows inclusion of an unlimited number of new concepts. Thus, Ranganathan further developed the generally accepted principle of decimal notation which enhances the vitality of the classification. FID accepted this principle for further improvement of UDC. There is yet another method of making a faceted classification more expansible and elastic. In this case the ending of a symbol should necessarily be added to the single division in the base and the
system should not have hierarchical sub-ordination within facets. In such cases the proportionality of the length of the new symbol is followed. This method is called the 'Group notation' by Ranganathan [6].

The principles underlying the notational system of facet classification make it more flexible than any other systems, and in this respect meet the third requirements of a satisfactory notational system.

References


