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Categorisation of Isolate Ideas: A Comparative Study.
(Universe of subjects. 3). (Classification problems. 65).

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[The emergence of the concept of the Fundamental Categories — Personality, Matter, Energy, Space and Time — first in an incipient form and later in a full-fledged form is traced. The method of identification, and the postulates and principles for the sequence of the fundamental categories are briefly discussed. A review of the various attempts at the postulation of a conceptual structure of subjects in order to facilitiate the helpful arrangement of subjects embodied in documents, is presented. The concept of the Five Fundamental Categories in Ranganathan's General Theory of Library Classification is relatively more versatile and comprehensive.]

ABBREVIATIONS USED :

(BS)	= Basic Subject	(MP)	= Matter-Property
(E)	= Energy	(MS)	= Main Subject
(FC)	= Fundamental Category	(P)	= Personality
		(IP1)	= Personality Isolate, Round I, Level I
(M)	= Matter	(S)	= Space
(MM)	= Matter-Method	(T)	= Time
(MMt)	= Matter-Material		

a* Terminology
To facilitate ready reference, the definitions of some of the specialised terms used in this paper are given below. Definitions of other specialised terms can be found in Part C of the *Prolegomena to library classification*, Ed 3, 1967.

a Idea
The product of thinking, reflecting, imagining, etc., obtained by integrating with the aid of logic, a selection from the apperception mass, and/or what is directly apprehended by intuition, and deposited in the memory.

b Subject

An organized or systematized body of ideas whose extension and intension are likely to fall coherently within the field of interest and comfortably within the intellectual competence and the field of inevitable specialisation of a normal person.

c Isolate Idea

An idea or idea-complex fit to form a component of a subject, but not by itself fit to be deemed to be a subject. Example: "Bacteria" denotes an isolate idea. It is not, by itself, fit to be a subject. But it is fit to be a component of subjects, such as Biology of bacteria, and Diseases of human body caused by bacteria.

0 Introduction

01 UNIVERSE OF SUBJECTS

Ranganathan's General Theory of Library Classification envisages the universe of subjects to comprise of the following varieties of subjects:

1 Basic Subject (A subject without any Isolate Idea as a component);

2 Compound Subject (A subject with a Basic Subject and one or more Isolate Ideas as components); and

3 Complex Subject.

Further, it has been observed that Compound Subjects form the majority of subjects in the universe of subjects. In order to maintain a consistency of pattern in the linear sequence of compound subjects, the classificationist has to keep invariant one and only one of the many immediate-neighbourhood relations found in n-dimensional space. This becomes difficult since many of the immediate-neighbourhood-relations at the phenomenal level put in their claim to be kept invariant. Therefore, Ranganathan's theory suggests a deep dive to a near-seminal level to reach something more stable and practicable, thus bypassing the complicated phenomenal level of isolates.

02 RECOGNITION OF FUNDAMENTAL CATEGORY

This descent to the near-seminal level led to the realisation that the large variety of isolate facets presented by all the subjects in the universe of subjects could be reduced to five types of isolate ideas — namely, Personality, Matter, Energy, Space and Time. This resulted in the Postulate of Fundamental Categories (23, 25) in 1944 for use in library classification. Prior to this postulation in CC, all the isolates other than Space and Time were given some descriptive names depending upon their respective basic subjects. For example, certain facets, now deemed

to be (P), had meaningful names, such as "wavelength facet", "cultivar facet". (MMt) was called as "Material facet" (27) and MP, (MM) and (E) were collectively called as "Problem facet".

03 IDENTIFICATION OF THE (FC) OF AN ISOLATE
031 Method of Residue

A suggested method for identifying the (FC) of an isolate facet forming a component of a compound subject is by the Method of Residue or the 'Neti-Neti Principle' (Not-This, Not-This Principle) (33). In this method, a kernel idea is correlated with each of the four (FC) — (T), (S), (E), and (M) — in succession, and if the kernel idea cannot be deemed to be a manifestation of any one of these four (FC), it was deemed to be a manifestation of the (FC) (P). This method yields helpful results in the Postulational Method of classifying subjects.

032 Core Component — Personality

Experience in designing depth classification schemes has shown that a typical subject going with a (MS) is essentially a study of the attributes or properties of a typical entity and its variety. The property may be studied with the entity in normal condition, or when it is subjected to various kinds of action or to different abnormal conditions or in terms of a space-time context or a combination of these. Thus, every subject deemed to go with the (MS) Medicine is a study of the property of "human body and its organs"; and every subject deemed to go with the (MS) Sociology is a study of the attributes of a social group of one variety or other. This entity which forms the focus of study in all the subjects going with a (MS) may be called the "core component".

It has been observed that

1 It is the core component which essentially determines the (MS) with which the subjects containing it may be deemed to go;

2 In the particular pattern of sequence of the components of a subject going with a (MS) prescribed by the General Theory of Library Classification, the variety of the core components forms the schedule of (1P1) isolates;

3 The core component essentially determines the isolate ideas in the (M) and (E) facets of the compound subjects deemed to go with the (BS) concerned;

4 Subjects going with different (MS) essentially differ in respect of their core components. For example, in the compound subjects going with the (BS) Survey Analysis, the different survey methods are deemed to be "core components" or manifestation of the (FC) (P), while a survey method, when applied to a particular

situation thus forming a facet, is deemed to be a manifestation of (MM) and not of (P). In other words, in the latter case, "Survey method", is not a "core component";

5 In determining the relative degree of affinity of subjects going with different (BS), greater weightage should be given to the relative affinity of their core components; and

6 In determining the difference between subjects going with different (MS), greater weightage should be given to the difference in respect of their core components (18).

Thus, it is the "core component" which is the manifestation of the (FC) (P). Norman Roberts, while examining the concept of Personality states that "the definitions of personality found in the literature suggest a concept that is to be understood in subject terms only, ignoring the crucial relationships between the users of subject materials and subject itself" (39). In other words, he states that Personality has been defined vaguely, and as such is likely to cause difficulties. However, it may be mentioned here that the two guiding principles — Postulate of Absolute Syntax and Canon of Helpful Sequence — in the General Theory of Library Classification state that the sequence of components of a subject, and the overall sequence of subjects should be helpful to the majority of readers. Therefore, while analysing a subject and assembling the components of every compound subject going with a (BS), the readers' approach or users' need is given due weightage, by deeming the core entity of that subject to be a manifestation of (FC) (P). For example, in the compound subjects going with the (BS) Survey Analysis, the different survey methods are deemed to be manifestation of the (FC) (P), because specialists in Survey Methodology are essentially interested in the study of "Methods". The fact that the manifestation of an isolate is to be determined by the subject context is the very basis of a freely faceted classification. For, one and the same idea, as indicated above, may be deemed to be a manifestation of different (FC) in subjects going with different (BS).

033 *Leading Part of System*

The concept of core component and deeming it to be the manifestation of the (FC) (P) is in conformity with the concept of "leading part" in "centralised system". In Paper W, contributed to this issue, it is shown that a subject can be considered as a system—an asymmetric, non-commutative, centralised system.

034 *Matter*

The manifestation of "Matter" is now deemed to be of three varieties, namely, Matter (Material), Matter (Property), and

Matter (Method). In 1944, when Ranganathan postulated $\times$ 034 the five (FC) to be (P), (M), (E), (S) and (T), he identified only Matter-Material as manifestation of the (FC) (M). All the other isolates which are now considered as manifestation of the (FC) (M), were included as "Problem isolates", and subsequently in 1952, as "Energy Isolates". This led to certain difficulties, since "Energy" was defined to connote action of one kind or another, and it was hard to explain how certain isolate ideas — such as, Morphology, Physiology, Disease, Civic rights and duties — could be deemed to be 'Energy'. This led to a closer examination of the (FC) 'Energy and Matter' in 1952. In that year, Vickery indicated that an idea deemed as a manifestation of Energy was multiple and not single. He suggested replacing "Energy" by more than one (FC). He wrote to Ranganathan about it and suggested the connecting digit " $\div$ " for property isolate. But the separation of "Action" and "Property" and "Action" and "Personality" was found difficult in many cases. Ranganathan then felt that it was "a case where we can divide but may not be able to rule" (26). Subsequently, in a paper on the classification of subjects in Chemistry, Vickery made out a strong case for differentiating between "Property" and "Action" at least in the field of Chemistry (43). In 1957, there was a vague identification by Ranganathan that "Property" was a manifestation of the (FC) (M) (28). It was only in 1958, when the preparation of a schedule of Common Property isolates was taken up that considerable re-thinking on the concept of "Property" was made. With the aid of practice in Thesaurus (40), it was decided to treat "Property', as a manifestation of the (FC) (M) (38). This decision was implemented for use in CC in 1966, after experience had shown that it was helpful to deem it as the (FC) (M). However, some of the isolates posed problems in identifying their manifestation. Most of these are action-associated isolates. The differentiation of Energy isolate from Property Isolate had been a problem. Neelameghan suggested (15) that the action-associated isolates may be grouped as an

1 Action-associated Isolate Idea occurring as an attribute *qua* attribute (not as qualifier) of one or other of the isolate ideas or with the (BS) and occurring in one and the same compound subject; and

2 Action-associated Isolate Idea occurring not as an attribute of any other isolate idea when either of them occurs in one and the same compound subject.

Each one of the isolates belonging to Group 1 may be deemed to be a manifestation of the (FC) (M) and that belonging to Group 2 may be deemed to be a manifestation of the (FC) (E). However, the concept of "Property" taken as Matter-Property Isolate

leads to difficulties in facet sequence of certain subjects. Neela-meghan and Gopinath have given illustrative examples to show that the sequence of facets presented by certain compound subjects, when analysed according to postulates, gives a sequence which does not conform to the implication of the Wall-Picture Principle, although the sequence is in conformity with the Postulates for Sequence (17). The problem is traced to taking "Property" as an isolate. A solution to this problem is to deem the idea "Property" as a Kernel Idea not as an Isolate Facet or a Speciator. Helpfulness suggests that the "Property" idea is given a bond strength greater than that of the 'Speciator' Idea and less than that of the Isolate Facet. However, the 'Property' Idea may go with any Isolate Facet, as determined by the Wall-Picture Principle.

In 1958, along with the identification that 'Property' was a manifestation of the (FC) (M), Ranganathan and Parthasarathy recognised that 'Method' was also a manifestation of the (FC) (M). But, as Ranganathan did not have an opportunity to work with actual documents in a library, the idea was not pursued. However, the tentative decision that all properties and methods were a manifestation of the (FC) (M) was experimented upon (20) and was finally confirmed (24). But it was generally found that a method isolate is immediately preceded by an Energy Isolate (16). Thus, three kinds of manifestations of the (FC) (M) were identified.

Neelameghan, in a recent paper (16), has shown that the question of deeming an idea denoting a "Method" as a mani-festation of the (FC) (M) does not seem to arise. He suggests that the idea denoting a "Method" may occur as

1   (1P1) isolate; or
2   Array division or speciator to "Property" or
3   Personality isolate immediately preceded by an Energy Isolate.
This suggestion requires further investigation.

035 *Energy*
The current definition of the concept of the (FC) Energy is that it connotes some kind of action *qua* action (32). Here, by action is meant action from an agent external to the system studied. For example, "Treatment" in "Treatment of heart disease". This is in contradistinction to "action" from within. For example, in "Physiology of human legs" and "Naming-ceremony among certain Polynesian communities", the concepts "Physiology" and "Naming-ceremony" suggest a flavour of an action. In other words, they do not appear to denote an "action *qua* action" with certituae. As mentioned earlier (Sec 034), Neelameghan has shown that these action-associated ideas are

Properties, and it is only an action-associated isolate idea occurring not as an attribute of any other isolate idea when either of them occurs in one and the same compound subject, that should be deemed to be a manifestation of the (FC) Energy (15).

036 *Space*
The concept of the (FC) "Space" is in accordance with what is commonly understood by that term. The surface of the earth, the space inside it, and the space outside it, are manifestations of the (FC) Space. The usual Geographical Isolate ideas — such as, continents, countries, and counties — are taken to be manifestations of the (FC) Space. Physiographical ideas — such as, desert, prairie, rain-forest, plateau, mountain, river and lake — are also taken to be the manifestations of (FC) Space (31).

0361 "Space" as Personality
When we consider the subject "History of India", the term 'India' does not denote the geographical area going by that name. But it denotes the community living in India. Hence, in this subject, the Isolate "India" should be taken to be a manifestation of the (FC) "Personality" and not of "Space".

037 *Time*
Time, is perhaps, the easiest of the (FC) for identification. The concept of "Time" is in accordance with what we commonly understand by the term "Time". The usual time isolate ideas — such as, millenium, century, decade, year, and so on — are its manifestations. Time isolate of another kind — such as, day and night, seasons such as summer and winter, time with meteorological quality — such as, wet, dry and stormy — are also taken as manifestations of the (FC) Time (30).

0371 "Time" as Personality
In the (BS) "Literature", an author is denoted by the year of his birth, instead of by his name. For example, Shakespeare is denoted by "1564". This is done to secure a helpful chronological sequence of authors and for providing infinite hospitality in chain. Therefore, one should not regard the Author Facet of the subject as a manifestation of the (FC) "Time", but as "Personality".
Thus, it is seen that the (FC) — Personality, Matter, Energy, Space and Time — are identifiable without much difficulty and can be used for library classification.

04 POSTULATES OF ROUNDS AND LEVELS
Continued work in the classification of micro ideas led to the recognition

1 Of the cycle of recurrence of the manifestations of the (FC) in compound subjects. This led to the Postulate of Rounds for (P), (M), and (E), the sequence of rounds being decided with the aid of the Wall-Picture Principle (35); and

2 That within one and the same round, a manifestation of one and the same (FC) may occur two or more times. This led to the postulates of Level and Level-cluster (36).

05 SEQUENCE OF P, M, E, S, T

The Postulate of Concreteness (37) which followed the enunciation of the Postulate of (FC) determines the sequence of the (FC) as Personality, Matter, Energy, Space, and Time. Hence, if a compound subject is made up of, besides the (BS), five isolate facets, one each from each of the five groups, the sequence would be (BS), (P), (M), (E), (S) and (T), according to the Postulate of Concreteness and Postulates of Basic Facet and Isolate Facet (34). The sequence, thus arrived at, is in conformity to what the majority of persons think in respect of the relative concreteness of the isolates which are manifestations of any one of the five (FC). It is also in conformity with the Wall-Picture Principle and other guiding principles.

051 *Shelf Sequence vis-a-vis the Sequence of P, M, E, S, T*

"In all activities relating to intellect, methodology in abstract is generally learnt before it is applied to concrete cases. As the intellect develops, the number of sensory experiences, concrete things and concrete concepts mount to a burdensome level. Consequently, generalisation begins very early. Abstraction follows side by side. Laws of a subject, hypotheses, normative principles, and methodology form the basic stuff first sought by a person with some intellectual development. Once familiarity with these is acquired, their application to particular concrete contexts becomes easier. Reading and understanding is essentially an intellectual activity. Therefore, the sequence from abstract to concrete is more helpful to the majority of readers than the opposite one" (29). In other words, the shelf sequence should adhere to the Principle of Increasing Concreteness, which states that "if two subjects are such that one can be said to be more abstract and less concrete than the other, the former should precede the latter An implication of this principle of an analytico-synthetic classification would be that the facets in the facet formula of a (BS) should be in the decreasing sequence of concreteness, and if the scheme has rounds of facets, the facets in each round should be in the decreasing sequence of concreteness. This is achieved by conforming to the Postulate of Concreteness.

06 CONSISTENCY OF PATTERN IN THE SEQUENCE OF COMPOUND SUBJECTS

Thus, with the aid of the Postulates of (FC), Rounds, Levels, Basic Facet, Canons of and Principles of Helpful Sequence, a consistency in the pattern of the sequence of compound subjects going with one and the same (BS), and in the overall sequence of subjects going with different (BS) has been achieved. This syntax of facets has been found to be satisfactory to the majority of users. And further, it has been conjectured that Facet Syntax arrived at on the basis of the Wall-Picture Principle is the same as the Absolute Syntax of ideas (13).

07 READER'S INTEREST AT THE MOMENT VIS-A-VIS SEQUENCE OF PMEST

In the earlier sections, the discussion was mainly the basis of the postulates regarding the sequence of components of Compound Subjects, and the principles used to secure a general sequence of the components acceptable to a majority of normal intellectuals. However, in actual practice, a specialist does not approach a document-finding system expressing his requirement coextensively and precisely. He approaches the system by one or two of the component ideas due to many reasons — such as

1 The specialist may, at the moment, be working intensively on one or only a few of them;

2 The specialist may continuously — and not temporarily — concentrate attention on a particular facet of a subject; and

3 Area studies constitute another variety of specialisation on a particular component idea in a subject.

These variations in the expression of a query about a subject do not imply any basic deviation from the Absolute Syntax of ideas in the mode of thinking of the specialists (19).

Thus, a document-finding system should take into consideration the normal mode of thinking among a majority of intellectuals, the varied approaches of specialists due to their respective specialisation at the moment, and other features of the psychology of readers while searching for information. Ranganathan's General Theory of Library Classification envisages such a model, which consists of

1 A *Classified part*, in which the entries for documents forming the input into the system are arranged in a classified sequence; and

2 An *Alphabetical part*, in which the entries in the alphabetical index to the subjects of the documents listed in the classified part are derived on the basis of a systematic procedure such as the Chain Procedure and its modified versions.

071 *The Search*

A specialist consults first the alphabetical index using the name of any one of the component ideas in the subject of interest. As the different subjects in the system having this idea as a component are brought together in the Alphabetical Part, the specialist selects the entry representing his subject interest. He notes the Class Number and goes to the Classified Part wherein the entries for documents on subjects of likely interest to him are arranged in a helpful sequence displaying their mutual filiation. This helps him to browse and select the documents of his interest.

Thus, it is seen that the Postulate of (FC) in conjunction with the Postulate of Concreteness and other guiding principles is able to help the specialists whatever be their approach to the system.

1 Theme of the Paper

With the above background study, the rest of the paper aims at presenting a review of the various attempts at the postulation of a conceptual structure of subjects facilitating the helpful arrangement of subjects embodied in documents. Further, it also aims to show that the Postulate of Fundamental Categories of Ranganathan's General Theory of Library Classification is the most versatile and comprehensive. A similar study of the Fundamental Categories has been made by Mane and Raizada earlier (12).

2 Impact of Fundamental Categories on Classificatory Ideas

The conscious recognition by Ranganathan in 1944 that the isolate ideas forming components of a Compound Subject could be deemed to be manifestations of the five (FC) has simplified to a great extent the analysis of micro-subjects embodied in documents — in the process of classifying as well as in the design of classification schemes. The outcome of research in classification has been the recognition by different classificationists of different categories for grouping ideas. In the succeeding sections, an attempt is made to

1 Present the categories made use of by different workers; and

2 Show that the categories proposed by others are reduible to or are variants of the five (FC) of Ranganathan.

3 Categories Applicable to Classification

Work in relation to the analysis of subjetcs in terms of categories has been attempted by different classificationists. For example, Dobrowolski, Cordonnier and Eric de Grolier in France; Brisch, Farradane, Foskett, Vickery, Mills, Kyle etc

in the United Kingdom; V P Cerenin, Vleduts and Stockolova of USSR; Perry, Kent, Shera and Egan in USA; and Selye in Canada.

31 FRANCE
311 *Dobrowolski*
The classification system designed by Dobrowolski, a Polish engineer, which is being used by the Institut International de la Soudure is a faceted classification system. It uses the concept of categories for arriving at groups of headings for fuels in welding. Dobrowolski's categories are:
1 Material;
2 Processes;
3 Applications with two sub-categories materials and manufacture;
4 Initial products;
5 General problems;
6 Properties;
7 Study and control; and
8 Industries and organisation.
No sequence for the combination of categories has been given by Dobrowolski. In an example cited in his paper (6), he has shown that any sequence of the combination of categories can be adopted.

312 *Cordonnier*
At the Dorking Conference (1957), Cordonnier presented a list of categories used in designing a special classification scheme for the Centre de Documentation des Constructions et Armes Navales. The categories used were:
1 Organisms and services;
2 Persons (miscellaneous categories);
3 Individuals (living beings) — biological conditions;
4 Bodies (Natural, simple, compound — miscellaneous conditions);
5 Miscellaneous equipment;
6 Miscellaneous actions;
7 Intellectual concepts;
8 Documentary forms; and
9 Time.

313 *Leroy and Braffort* (1959) *and Ruvinschii* (1960)
Leroy and Braffort have recognised three categories — objects or entities; properties and conditions; and actions. Ruvinschii has worked out a classification with the same three categories, but has reversed the sequence suggested by Leroy and Braffort. His sequence is Action, Properties, and Objects.

314 *De Grolier*

De Grolier, on the other hand, has suggested ten categories which are grouped broadly into two groups, namely — constant categories and variables. The former consists of the categories Time, Space and Action, while the latter comprises the categories Substance, Organ, Analytic, Synthetic, Property, Form, and Organisation (44).

32 GERMANY

The 'Systematik der Sachverhalte' of Germany is essentially a classification scheme for the subject Inorganic Chemistry. In this scheme, the categories used for analysis are:

1 Matter;
2 State of Matter; and
3 Processes or Properties.

33 UNITED KINGDOM

Members of the Classification Research Group of Britain, established in 1948, have contributed appreciably to modern classificatory ideas. The contribution of Vickery, Barbara Kyle, Foskett, Farradane, Mills, and Aitchison, are among the well-known. However, the influence of Ranganathan's idea is discernible in the faceted schemes produced by the CRG. Others who have experimented with this concept are Brisch, Seymour and Claridge in their respective fields. The efforts of the latter have a resemblance to those of CRG. Much of the work of the CRG in the first decade was devoted to the designing of special schemes of classification for special subjects, and it is only in the past ten years that attention has been devoted to developing a General Theory of Library Classification.

331/334 *Classification Research Group*
331 *Farradane*

Farradane believed that classification was not just an ordering of single concepts into groups. In other words, Farradane doubted and abandoned the idea of universe of subjects being divided into Basic Subjects, Main Subjects, Non-Main Subjects, Compound Subjects etc, and maintained that it was from the universe of concepts that all compound subjects must be ultimately constructed (21). To justify his mode of approach, he cites the psychological work on the learning process. He recognised, for analysis of subjects, four basic concepts which are similar to Guilford's concepts:

1 Entities;   ·
2 Activities;
3 Abstracts; and
4 Properties.

But, his concepts have not been defined clearly. He tries to explain his concepts by citing examples. However, the concepts "Abstracts" and "Properties" are likely to give difficulties, as there is no clear delineation of the concepts. In Farradane's opinion completely abstract forms of properties will be listed in Abstracts. Further, as he points out a certain degree of difficulty is envisaged in the idenitfication of the 'levels of complexity' with reference to 'Activities and Abstracts' (1, 2). The sequence to be maintained in the combination of the concepts has not been indicated.

332   *D J Foskett*
Foskett has designed three faceted classification schemes — Metal Box Company's classification system, for Food technology, and for Health and Occupational Safety — using the concept of categories for analysis of the subject.

3321   Metal Box Company's Classification Scheme
In this scheme (7), Foskett, makes use of five facets or categories as he calls them. They are
1   Products;
2   Parts;
3   Materials;
4   Operations; and
5   Miscellaneous common subdivisions.

3322   Food Technology
For Food Technology, he has made use of the first four categories — Products, Parts, Materials, and Operation (9).

3323   Health and Occupational Safety
In his scheme for 'Health and Occupational Safety' (8), there are sixteen divisions. They are:
1   Physical agents and natural phenomena;
2   Substances;
3   Premises, equipment, processes and operations;
4   Organization, of labour and industrial structure;
5   Fire and explosives;
6   Pathology;
7   Physiology and psychology;
8   Research techniques;
9   Medical prevention and treatment;
10   Techniques of safety and health;
11   Equipment for individual protection;
12   Organisation of safety and health;

13 Categories of persons;
14 Industries;
15 Special aspects; and
16 Generalia

The sixteen divisions mentioned above can be reduced to his five categories.

333 *Barbara Kyle*

At the request of the International Committee on Social sciences Documentation, Barbara Kyle made a systematic attempt to design a classification scheme for the Social sciences (11). Her approach in the design was based on two categories or facest namely Personalities and Activities. She, like Farradane, abandoned the idea of traditional disciplines in her scheme and arranged all the ideas or concepts irrespective of their origin, under the above-mentioned facets. The sequence between the two categories, is "Activities" precedes "Personalities". It is obvious that in her scheme, she has taken into consideration the categories "Space and Time", since they are listed at the beginning of the schedule.

334 *Vickery*

Vickery, while acknowledging the usefulness of Ranganathan's five (FC) in the analysis of the subject, in his book "Faceted Classification" (1970) has suggested that more precise categories can be assimilated into them. He advocates the use of nine groups of categories for this purpose. They are:

1 P Substance, Product, Organism;
2 O Part, Organ, Structure;
3 C Constituent
4 Q Property and measure;
5 R Object of action, raw material;
6 E Action, Operation, Process, Behaviour;
7 A Agent, Tool;
8 G General property, Process, Operation; and
9 S,T Space and Time.

The combination suggested by Vickery for these categories is P,O,C,Q,R,E,A,G,S,T.

335 *Mills for BSI*

Mills has suggested in the *Guide to the UDC* (10) that the subject matter of nearly all documents is complex in nature, and that it would be helpful to break the subject matter of documents into facets and sub-facets. Based on his experience and that of CRG, especially the work of Vickery, he has recognised eight

facets and suggested the following facet formula for citation order:

Whole thing — Kinds — Parts — Material —
Properties — Processes — Operations — Agents

336   *English Electric Scheme*

The English Electric Company's scheme (45) for Engineering designed by Aitchison was first published in 1958. It is essentially a faceted scheme. This scheme also abandons the idea of traditional main classes and bases its scheme on "fundamental" concepts or categories discernible within the idea, and "one place per concept" philosophy. Vickery was critical of the abandoning of the traditional classes as it created some problems. For example, there was no place in the schedules for electrical, mechanical or hydraulic engineering, since their constituent parts were scattered over the primary categories. Another criticism of the use of the fundamental concepts was that it is "hair splitting", the tendency to create places for concepts so closely associated that tests have shown that to divide them means loss of recall (45). The primary categories recognised by the scheme are:

1   Industries;
2   Machines and systems;
3   Ancillary plant and components;
4   Materials;
5   Physical phenomena;
6   Operations;
7   Agent (Instruments and equipment);
8   Language and form divisions; and
9   Geographical divisions.

337   *E G Brisch*

The Brisch system of classification for use in Industry for classification of objects — materials, pieces, etc — makes use of the concept of categories. In this system (3) the elementary characteristics are grouped under the following categories:

1   Form;
2   Nature (Raw materials);
3   Function;
4   Dimensions, etc.

Based on this scheme, a classification applicable to concepts has been evolved for the 'Service de Documentation de l'Agence Europeenne de Productivite'.

34   CANADA
341   *Hans Selye*

The "Symbolic Shorthand System" (SSS) for physiology and medicine (41) has been the work of a single scientist, Hans

Selye. As he found, according to him, the existing classification systems unhelpful and unsuitable due to the complexity of notation, he designed his system on the basis of two concepts — Target and Agent, the sequence among these being that the former precedes the latter. However, he pointed out that these two concepts are interchangeable depending upon the subject classified. In other words, the concepts were determined as targets or agents depending upon the compound subject in which they occurred. His system consists of 20 main classes, eight 'static categories' and a set of fifteen symbols to indicate the relationships between the concepts.

35 USA
351 *ASM-SLA System*
This classification system for Metals was published in 1950 through the joint efforts of the American Society for Metals and Special Libraries Association (4). It is a scheme developed by the specialists for the specialists. The three categories or concepts made use of are:
1 Processes and properties;
2 Materials; and
3 Common variables (Equipment, Processes, Facts which influence processes, types of products, foundry defects, form of documents, languages and places).

352 *Perry, Kent and Rees*
With the objective of (a) Symbolizing explicitly in a consistent manner the important aspects of the contents of documents and (b) Maintaining the relationships between concepts in a uniform manner, regardless of the various form of phases used in written language, Perry and Kent (1959) studied documents relating to Metallurgy (22) and recognised twenty-three role indicators which, in their turn, could be grouped into five categories. They are:
1 Materials;
2 Properties;
3 Processes;
4 Conditions; and
5 Miscellaneous role indicators.
While working on special codes which are ancillary and supplementary in character to the General Code for encoding Metallurgical literature for computer-based document finding systems, Rees and Perry considered in particular, the following categories:
1 Substances, compositions and materials;
2 Machines and electrical devices;

3 Geographical regions, locations etc;
4 Organizations;
5 Persons;
6 Plants, animals and other biological organisms; and
7 Mathematical terminology.

353 *Shera and Egan*
    Shera and Egan have suggested seven categories for use in classification (44). They are:

1 Agent;   5 Time;
2 Action;   6 Space; and
3 Tools;   7 Product.
4 Object of action;

36 USSR
361 *Cerenin*
    Cerenin, for the development of his 'informational language' collected 1000 abstracts from the abstract bulletin of the Soviet Union's Academy of Sciences, Mechanic sections—1953. On the basis of the analysis of the subjects contained in the documents, he was able to isolate 4000 terms (which included synonyms) representing some concepts in the field of mechanics. He grouped these concepts into five general categories for 'primary indexing'.

1 Processes and states;
2 Objects;
3 Properties;
4 Abstract concepts; and
5 Proper names.

For 'secondary indexing' he grouped the five into two — Basic subjects (objects and processes); and Attributes, methods and operations. His work is in the experimental stage (5).

362 *Vleduts and Stokolova*
    Vleduts and Stokolova have designed a method using predicate calculus called as 'Standard phrases', which they have used in constructing an 'Information Language' having grammar. This method has been suggested by the authors, as they felt it has one of the most important and most promising tasks of fundamental research in the field of informatics (46). In this procedure, a specific subject is studied in all its aspects, and 'situations' which are semantically similar, are isolated and grouped together. This method recognises five types of situations. They are

Type 1.— Physical entity, and attributes that identify the entity — structure of compound, state in which it is studied, name of species, phase of development, sex etc;

Type 2.— Properties — Physical, biological, structure of organism, its parts, systems of organs etc.;

Type 3.— Processes;

Type 4.— Research or study of various entities previously described by situations I, II, and III with possible mention of methods of study, apparatus etc;

Type 5.— Comparison of various facts, reportable in the description of the situations and about certain theoretical connection between these facts.

The authors have tried to explain these 'situations' with examples from Chemistry and Biology. Further, they trace similarity to the 'facet analysis', used in the construction of faceted classifications. From the examples cited in their paper, the preferred sequence of facets is :

Physical entity — Attributes identifying the entity — Properties — Processes — Research or study of various entities, including methods of study, apparatus, etc — Comparison.

37 CZECHOSLOVAKIA
371 *J Toman*

Toman has devised a faceted classification which is rigidly faceted. This system uses a mnemonic notation as well as the concept of categories. His categories in the sequence of combination are:

1 Activities;
2 Sources of information;
3 Means and devices;
4 Organisation;
5 Persons; and
6 Theory.

His classification formula provides four places for the six categories — the first three places are reserved for the three categories and the fourth place is reserved for the other three categories. In the classification formula, every category has to be represented. In the absence of a particular category, it should be indicated by a "0" (zero). The author concludes that his system is useful only for special fields (42).

The " Table of Categories " presented in Sec 4 gives a synoptic view of the various categories of ideas recognised by different classificationists and shows how they can be grouped or reduced to the five Fundamental Categories—Time, Space, Energy, Matter and Personality—of the General Theory of Library Classification formulated by Ranganathan.

4 Table of Categories

SN	Name	CATEGORIES							N of categories
		(P)	(M)			(E)	(S)	(T)	
			(MMt)	(MP)	(MM)				
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
1	Ranganathan	Personality	Material	Property	Method	Energy	Space	Time	5
2	Dobrowolski	Initial products, Industries, Organizations	Material	General Problems Properties	Processes	Study and Control			8
3	Cordonnier	Organisms Services, Persons, Individuals, Bodies Intellectual concepts, Documentary forms			Miscellaneous equipment	Miscellaneous actions	Places		9
4	Leroy, Braffort Ruvinschii	Objects/Entities		Properties		Action			3
5	De Grolier	Organ, Form	Substance	Property		Action Analytic, Synthetic, Organisation	Space	Time	10

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
6	Systematik der Sachverhalte	Matter		State Properties	Processes				3
7	Farradane	Entities		Properties Abstract		Activities	Abstract	Abstract	4
8	Foskett (D J)	Products, Parts	Materials			Operations			4
9	Barbara Kyle	Personalities (Natural phenomena, Artefacts, Purpose, Aims, Ideas etc.)				Activities			2
10	Vickery	Substance, Product, Organism, Part, Organ, Structure, Agent, Tool	Constituent, Object of action, Raw materials	Property, Measure, General property	Processes General process	Action Operation General operation	Space	Time	9
11	Mills for BSI (Guide to UDC)	Whole thing, Kinds, Parts, Agent	Material	Properties	Processes	Operations			8
12	Aichison—English Electric Scheme	Industries, Machines and Systems Ancillary plant and components, Agent	Materials	Physical phenomenon,		Operations	Geographical divisions		9

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
13	E G Brisch	Form	Raw Material	Function Dimension					4
14	H Selye	Target, Agent							2
15	ASM-SLA Systems	Material		Properties Common variable index	Processes Common variable index				3
16	Perry, Kent, Rees Jr	Material, Miscellaneous role indicators		Properties Conditions	Processes		Miscellaneous role indicators	Miscellaneous role indicators	5
17	Shera and Egan	Product, Agent, Tool	Object of action				Space	Time	6
18	Corasin	Objects, Proper names		States Properties	Processes	Operation Abstract concepts	Abstract concepts	Abstract concepts	5
19	Vleduts and Stokolova	Physical entity, Attributes that identify the entity (Type 1)		Properties (Type 2)	Processes (Type 3)	Research or study (Type 4)			4
20	Toman	Sources of information, Organisation, Persons,		Theory	Means and Device	Activities			6

5 Annotation

    1   It can be seen from the table that the various categories proposed by different classificationists for analysing and classifying the universe of subjects are reducible to the five (FC) — Personality, Matter, Energy, Space and Time — of S R Ranganathan.

    2   The categories "Space and Time" seem to be either explicitly stated or implicit in the categories enumerated by the different classificationists.

    3   As regards the number of categories suggested by different classificationists, the range is between two and ten, the maximum being that of De Grolier and the minimum that of Kyle, and Selye.

    4   The classificationists, who have used the concept of 'Categories' for classification, are largely from the United Kingdom followed by France, USA, USSR, Canada, Czechoslovakia and Germany.

    5   Most of the classificationists have used categories for designing special schemes (restricted to certain subjects) of classification. But Farradane's work deals with the universe of subjects in its entirety, free from the traditional main classes. His is 'universe of concepts'.

    6   The categories used by the classificationists have not been defined clearly, that is, there is no clear delineation of concepts used. For example,

(*a*) Farradane says that abstract forms of properties are to be considered as 'abstract' and not 'property';

(*b*) In some cases two or more concepts are put under a single category — Processes or properties category of 'Systematik der Sachverhalte' and ASM-SLA System; and

(*c*) Though concepts such as space and time are universally recognised, some classificationists, such as Farradane, and Cerenin consider them together as 'Abstract' concepts.

    7   The categories reducible to the (FC) (P) are only varieties of a typical core entity. The categories proposed by the different classificationists are:

(*a*) Isolates derived on the basis of characteristics;

(*b*) Levels of (P) belonging to the same round or another round. For example, Foskett's "Part" and Vickery's "Part and Organ" are levels of (P); and

(*c*) Speciators which qualify the Principal idea.

An example of a Speciator used as a category can be seen in the work of Mills where he talks about "kinds" and also in the work of Vleduts and Stokolova who consider "Type 1" situation as "Physical entities, and the Attributes that identify the entity" such as, Name of Species, Sex etc.

8 The categories proposed by other classificationists which have been deemed to be the (FC) (M) of Ranganathan are essentially of three kinds though they have been called by different names. They are:
1 Material/Substance
2 Properties
3 Processes/Methods
This is in conformity to the recent thinking of the concept of the (FC) (M) of Ranganathan. The (FC) (M) consists of (MMt), (MP), and (MM). The sequence of combination is (MMt); (MP) and this conforms to the Wall-Picture Principle and the Principle of Decreasing Concreteness. As regards (MM), it is always preceded by (E).

9 The categories reducible to the (FC) (E) have been denoted by the terms "Action, Operation, Activities" by other classificationists. Some of the classificationists have taken isolates such as "Study, Control" as separate categories.

6 Conclusion

The Postulate of Fundamental Categories of Ranganathan appears to be the most helpful approach for the design of schemes for library classification. Its helpfulness has been demonstrated by adopting the PMEST for the design of a general scheme for classification, such as CC, and also for its depth versions (14). But, the categories postulated by the others have not been experimented upon on such a large scale. In many a case, they have been used to design special schemes for classification only.

During the last ten years, the connotation of PMEST has been made increasingly more explicit. On the other hand, the connotation of each of the different categories enunciated by others have to be taken to be implied and therefore, they cannot be easily adopted by others. Therefore, the latter work can be considered as empirical in nature, operative at the phenomenal level, whereas the Postulate of Fundamental Categories taken along with Postulate of Sequence, Postulates of Rounds and Levels and the Postulate of Basic Subject give a definite set of instructions for guiding the design of schemes for classification, as well as for classifying. Therefore, they form the only existing fully developed, consistent set of guiding principles within the frame work General Theory of Library Classification.

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