# Dr. S.R. RANGANATHAN'S
## FIFTY YEARS OF EXPERIENCE IN THE
## DEVELOPMENT OF COLON CLASSIFICATION

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# GENESIS OF COLON CLASSIFICATION (1924)*

## S.R. Ranganathan

### 1. Starting with ignorance

From 9 July 1917 to 4 January 1924, I was teaching mathematics in different colleges in Madras.  In the afternoon of the latter date, I took charge of the Madras University Library.  I was the first to be appointed as its librarian. I then knew nothing of library work, inspite of my having been a regular user of the then newly formed Madras University Library.  It has a Paste-Down alphabetical author Catalogue.  It was not of much help in selecting books other than those already known.  There was no member in the library staff beyond a matriculate and he could not give much help.  But there was a separate Accession Register for the books acquired on the recommendation of the Board of Studies in each subject.  The staff were kind enough to give me access to the Accession Registers for Mathematics and Physics.  From here, I used to select books for my study.  Then, I had not even heard of the term 'Library Classification; --- that is, classification of books by subject.  With this ignorance in abundance, I was deputed by the University to study Library Science in the British Museum Library, london.  But its Principal Librarian and Superintendent, Sir Federick Kenyon, told me in effect, "You have been sent to the wrong shop!  Our methods are not modern.  Join the School of Librarianship in the University College down in Gower Street".  At my request, he was so kind as to telephone immediately to Ernest Baker, a Professor in English and the Director of the School of Librarianship: And I was admitted to the School that very day.

### 2. First Glimpse of Library Science

The University College had a good library on Library Science.  Of Course, the number of books on the subject available in those years was very small.  The Library was in a special room.  I took a key to the room against a small deposit of five shillings.  My residence was in YMCA Indian Students' Hostel, the very next building.  This enabled me to spend 9 am to 11 pm or even till midnight in the Library, everyday including Sundays, except for attending classes for two hours on each weekday.  This gave me the first glimpse of Library Science.

*   Colon Classification its generic and development. A note prepared by S.R. Ranganthan. 1971-72. (Fifty Years of Experience in the Development of Colon Classification)

## 3. Charm of Classification

All the branches of Library Science were interesting. But, Classification truely charmed me. The teaching of this subject by W C Berwick Sayers made it even more so. Decimal Classification (DC), Expansive Classification (EC), Subject Classification (SC), and Library of Congress Classification (LC) were engaging me full time for nearly three weeks. The attraction of DC was reinforced by a complete set of the Classified Catalogue of the Carnegie Library of Pittsburgh and by the classified periodical accession lists of the Mitchel Library of Glasgow. They were based on DC.

## 4. Dissatisfaction with Decimal Classification :

But DC did not give satisfaction. Many compound Subjects did not get a co-extensive DC number. All the facets of the Class Number of a Compound Subject, except the last one, were frozen. My dissatisfaction was traced to this fact. Of course, this fact was due to DC being Enumerative. It enumerated most of the Compound Subjects known, and represented them by Decimal Fraction Numbers. But it could not provide co-extensive Class Numbers for all the new subjects formed in the twentieth century. The books embodying these new subjects had to be given forcedly one or other of far more extensive Class Numbers. This made consistent decision difficult. This led W S Merill to publish his *Code for classifiers* (1928). Virtually, it was a list of the libraries in USA placing the new subjects forcedly in this or that of the possible more extensive Class Numbers. "Is the design of DC faulty?" came the feeling. At the time of its design, it might have worked well. However, faith, the genius, and the persistence of Melvil Dewey made librarians as well as readers accept Library Classification as a help.

## 5. A Possible Remedy

The feeling of the faulty design of DC led to an exploration of every possibility of re-designing the Foundations of a Scheme for Library Classification. No light would come for a few days. The mental strain was great. At that time, I happened to visit one of the Selfridges' Shops in London. I was attracted by the stall demonstrating the use of a Meccano set. With a few slotted metal plates, two small thin metal rods, a few metal hooks, a few bolts and nuts, and a few short thin pieces of string, the man demonstrated the making of toys in the shape of truck, crane, and many others. I saw this for the first time. It gave me

the clue. Instead of selling read-made rigid toys, the man showed a few fundamental components; with these a child could itself make any toy. So it should be with Class Numbers. That was my feeling. Instead of providing ready made Class Numbers for Compound Subjects, it should be possible to construct the Class Number for any such subject by combining together an assortment of a few appropriate component numbers taken from short schedules for component ideas. We now call the collection of each list of component ideas by names, such as the Schedule of Basic Subjects and the Schedules of Isolates of various kinds.

## 6. Working with Sayers

One evening in October 1924, W C Berwick Sayers and myself spent some time in the cafetaria of the University College, London, in designing a Scheme for Library Classification along these lines. A Basic Facet was of course inevitable as the first facet of any subject. Time Facet and Space Facet suggested themselves as possible Isolate Components. Another Category of Facets, called by different names in the context of different. Basic Subjects – say, as Crop Facet in Agriculture – was also easily thought of as a possible kind of Isolate Component. We now denote this by the generic term 'Personality Facet'. A few other components were all clubbed together under the name 'Problem Facet'. Roman capitals were used as the initial digits of most of the Basic Subject Numbers and of the Time Isolate Numbers. Indo-Arabic Numerals were used as the Initial digits for most of the other Isolate Numbers. The digit ":" (Colon) was used to function as "bolt and nut" in assembling the various components of the Class Number of a Compound Subject to distinguish it from the Class Number of a bare Basic Subject. It was so denoted because the digit ":" (Colon) was made to play an important role in the Class Numbers of the scheme.

## 7. Worthy of Attempt

That evening, it was decided that such a foundation for a Scheme for Library Classification was worthy of attempt. No doubt, difficulties would turn up. They should be overcome as and when they turn up, instead of brooding over every possible difficulty, at that very early stage. For, this would make any tangible progress impossible. With provisional schedules, several of the titles in the cumulative monthly issues of the Publisher's Circular were given co-extensive Class Numbers. They arranged the subjects in a helpful sequence.

## 71. Colon Classifiction

It was decided to denote the Scheme so designed by the term "Colon Classification" (CC).

## 8.  Sense of Hope

### 81.    Pilot Project on Board the Ship

In June 1925, I was sailing back to Madras in the ship M.V. Dumana.  The first few days of the voyage were spent in trying out CC in its incipient from in classifying the few hundreds of books of the ship's library.  This was  done as a pilot project.  The Captain of the Ship was very friendly and gave me the freedom to arrange and rearrange the books as I liked.  Some of the passengers appreciated the helpfulness of the resulting sequence.

### 82.    Large Scale Work

Before leaving London, I had got from Madras an interleaved copy of the printed Alphabetical Author Catalogue of the Madras University Library.  I started putting CC Numbers against the titles in the printed catalogue.  Against every oblique title, not plainly disclosing its subject, a special mark was put against it.  The number of books excluding periodicals, was only about 20,000.  I completed the work before arriving at Madras.

### 83.    Sense of Joy

All along, the schedules for the different kinds of isolates were amended, improved upon, and added to.  This work produced a sense of joy.  It also induced a sense of hope on the possible success of the adventure.

# DEVELOPMENT OF COLON CLASSIFICATION (1925 to 1932)

## 1.  Early Development

The early development of CC was in the Madras University Library during the eight years – 1925 to 1932.  During this period, about 20,000 current books and back volumes of about 1,000 periodicals were acquired.  This was in addition to the old 20,000 books and some back volumes of about 300 periodicals.  At the time of my taking charge, the books were found arranged on the shelves alphabetically by names of authors.  In the first year, I had to do all the work single-handed.  For,

1.  The staff had poor qualification.
2.  Only one of the four had passed the Metriculation Examination; and
3.  One had passed only the Primary School Examination.

In 1926, five fresh graduated were recruited.  Of these, C Sundaram and K.M..Sivaraman soon acquired the pioneer's spirit.  And they associated themselves with me in the work of designing CC, in addition to routine work.

## 2.  Procedure

## 21  Class Number

The schedule of Main Subjects (MS) was finalised.  A copy of it was given to each of the five graduate assistants.

## 22  Forming Literature Group

In the first instance, they picked out all the books in the Main Subject '.  They were assembled together in a few book racks.

## 23  Forming Language Groups

Thereafter, the staff were given the Schedule of Language Isolates (See Chap DG).  With its aid, they sorted out the books in Literature.  The books in English Literature were first taken up for further work.  For

1.  They formed the most numerous single group. And
2.  They were the most used.

**24    Forming Form Groups**

With the aid of the  Schedule of Form Isolates, these books were sorted out into Form-Groups.

**25   Forming Author Groups**

Thereafter, the books in each Form Group were sorted out into the Author-Groups.

**26  Forming Work Groups**

Then the works of one and the same author were sorted out into the Work-Groups.  The works of an author were arranged in a chronological sequence.

**27    Forming Group of Approached Documents**

Lastly, the approach documents – such as, Bibliography, Encyclopaedia, Periodical, Serial, Biography, and Collected Works – bearing upon Literature as a whole or a Language – Isolate, or a Form-Isolate, or an Author, or a Work, as the case may be, were inserted at the beginning of the respective groups.  [From 1970, a Double Inverted comma (") is used  as the Indicator Digit for an ACI].   They  were  arranged  among  themselves  according  to  a provisional schedule drawn up for Anteriorising Common Isolates.

**28  Schedule for Authors**

The schedule for authors was constructed by the Chronological Device, (See Chap CU) using their respective years of birth as  the spoch.

**291.    Construction of Work Number**

The Work  Number was constructed either on a one-digited base or two-digited basis as warranted.

**292    Finalising Class Number**

The Anteriorising Common Isolates Digits if any were added according to prescribed rules.  This step completed the Class Numbers.

**292.    Writing the Class Number**

The Class Number of each book was written in pencil on the tag on the spine fixed just 1" above its bottom, at the back of the title-page, and in the one other, standard page.

**3       Book Number**

The books were then arranged by Class Numbers.  The result was completely revised personally by myself.  After being passed, the Book Number was added in each book.

**31      Call Number**

A combination of a Class Number and a Book Number is denoted by the term 'Call Number'. (See Chap CA). A Class Number and a Book Number are written either in

1.      Two lines, one below the other – for example,

O 15, l(gN 72); or

One line, with a space between them—for example,

O 15,l(g N72).

The books were then finally arranged according to their respective Call Numbers. Temporary Bay-guides and Shelf-Plank Guides were provided. Each Guide carried on it the Class Number and the name of the subject (The translation of the Class Number) in English, put in the Bay Guide or Shelf Guide, as the case may be. For example,

1. Bay guide contained O,15,l   Sanskrit, Poetry; and
2. One of the Shelf Guides in the Bay contained O,15,1 "g Sanskrit, Poetry "Evaluation".

The Call Numbers were entered in the alphabetical bound catalougue for public use.

**32   Personal Help to Readers and the Lower Staff**

During the period of transition, I personally helped the readers and the lower staff in locating particular books on demand.

**32  Cataloguing**

Concurrently, another squad of staff prepared catalogue cards for each book according to the provisional draft rules of the **Classified Catalogue Code**, then in  preparation. The accession card and the shelf-register card were also written for each book.

**4.  Testing Acceptability**

The books were arranged on the shelves according to their Call Numbers. Competent readers were invited to browse among them. All their suggestions for improvement were noted. Open Access was given to the Classified Section of the Collection. Reference Service was given to each reader. Their reactions to the arrangement of the books were observed.

**6.   Incorporation of Acceptable Suggestions**

The suggestions for improvement were all examined. Whatever were acceptable, were incorporated in the schedules and also carried out in the Call Numbers.

**7.    Schedules for Other Subjects**

The schedules for the other subjects could not be designed all by myself.  Therefore, the help of subject experts – my former colleagues in colleges – was freely taken.  Here is a list of the chief among them :

| Name of person | Subject |
| --- | --- |
| Edward b Ross | Mathematics, and the Scheme as a whole |
| K Ananda Rao and | |
| G.A. Srinivasan | Mathematics |
| J  P Manickkam | Physics |
| M V Ekambaranathan | Engineering |
| B B Dey, U Mudlagiri Nayak | |
| and S Lakshmi Narayanan | Chemistry |
| T N Muthuswamy | Geology |
| M S Sabhesan | Biology, Botany, Education, and the Scheme as a whole |
| P R Gopala Ayyar | Zoology |
| M Guruswamy Mudaliar | Medicine |
| S Kuppuswamy Sastriar | Sanksrit classics, Linguistics, Religion, Philosophy, and the Scheme as a whole |
| T R Chintamani | Linguistics, and the Seheme as a whole |
| A S Woodbourn | Psychology |
| N Subramanian | Geography |
| P S Sivaswamy Ayyar | Political Science and Law |
| S Varadachariar | Law |
| S Venkataraman | Law |

The procedure described in section (Sec) AB21 to AB22 was followed in classifying the books belonging to each Basic Subject.

**8   Periodical Publications**

Finally, the periodical publications were classified in accordance with the rules framed for the purpose and given in Chap 2, Part 1 of CC, Edition (ED) 1 (1933).

**9   Refractory Documents**

After this, about 5,000 documents, mostly pamphets, were left over for want of detailed schedules to classify them.

**91   Fault in the Early Stage of CC**

While using the Indicator Digit ":" (Colon), ideas were not quite clear about its exact function, although we now define it clearly.  Therefore, in 1924, the Indicator Digit was not put  between two consecutive Facet Numbers, in case the last digit of the former and the first digit of the latter were of different species.  The absurdity of this wrong practice was not seen till 1930 – that is, till about 30,000 books had been classified.  The absurdity was experienced quite often in the  Class Numbers of Compound Subject going with the (MS) "V History".  Consider, for example, the following sequence in which the subjects were thrown as a result of the omission of the Indicator Digit between the Problem Facet (as it was called in those days) and the Time Facet.  In these examples, the isolate numbers have been taken from the Schedule of Problem Isolates in Chap "V History" of CC, Ed 1 (1933)

> V56:255M7   Franchise in Great Britain upto 1870s
>
> V56:25M7     Political rifhts and duties in Great Britain upto 1870s
>
> V56:2M7       Constitution of Great Britain upto 1870s

This violates the Canon of Decreasing Extension.  (See Sec AH3141), No doubt the Canons were not enunciated at that time.  There was an involuntary revolt against this unhelpful arrangement.  This fault was rectified in 1930 by the insertion of the Indicator Digit ":" (Colon) between the Problem Facet Number and the Time Facet Number.  The resulting arrangement was as follows :

> V56:2:M7       Constitution of Great Britain upto 1870s
>
> V56:25:M7     Political rights and duties in Great Britain upto 1870s
>
> V56:255:M7   Franchise in Great Britain upto 1870s

Even in CC, Ed 1, this idea was incorporated.

**92.   Correction of Class Number**

By 1930, about 3000 books had already been classified in (MS) "V History". The Class Number of each book occurs in four places in the book itself – the tag on the spine, the date label, the back of the title-page, and the standard page.  Further, it occurs on an average in five catalogue cards, one shelf register card, and one accession card.  It also occurs in the

book card. This makes a total of twelve places. The ":" (Colon) had to be inserted in all these twelve places for each book. My colleagues were young. They had all the enthusiasm of pioneers. They were proud of their being new. They said to themselves, "Nothing new can be found without Perspiration". Therefore, we all did this correction work as a pick up work in addition to our normal work. This correction work arose out of the Trial and Error Method used in designing CC in those years, without any guiding principles.

## 91. Correction Work Always Inevitable

Today, we have guiding principles and yet correction work becomes inevitable on account of the continuing development in the Universe of Subjects quite beyond the control of the classificationist and the library profession. Such correction work is ever necessary in any scheme for library classification used. Compare Ed 16 and Ed 17 of DC with each other and with the earlier editions. UDC is publishing correction lists from time to time: See their P Note. They are more than 800 in number. But unfortunately, some librarians of today continue to use outmoded old editions of CC, DC, and UDC. In defence, they speak of "Practical difficulty". The Laws of Library Science, particularly Law 5, would urge them to give up this attitude and carry out the corrections in Class Numbers made necessary by the ever-continuing development in the Universe of Subjects.

## BEGINNING OF THE THEORY OF LIBRARY CLASSIFICATION (1933 to 1939) AND A PERIOD OF AFTERMATH

### 1. GENERAL GUIDING PRINCIPLES

The development of CC from 1924 to 1932, led to the publication of its Ed 1 in 1933. The only guiding principles in the design of CC, for that edition, were the six general laws for thinking (See Sec AH1) and the Five Laws of Library Science (See Sec AH2). There were no guiding principles specific to the work of designing a Scheme for Library classification.

### 2. TRIAL AND ERROR METHOD AND TRACE OF INTUITION

Whatever was done depended largely upon Trial and Error Method conditioned by the moment –to-moment experience and a feeble gleam of light emerging now and then form a small trace of intuition. A scheme designed with the aid of cent percent intuition, would be a "Perfect Perfection". But my design was far from it. Therefore, I was all along conscious of the probability for mistakes and inconsistencies.

### 3. READER'S REACTION AND CORRECTION OF INCONSISTENCIES

After the publication of Ed 1, the staff was increased. The five graduates who had grown with me in the thick of the fight in the early years of design work were put on whole time reference service on the floor of the stack room. I myself spent as much time as possible on floor duty.

1. Readers were observed;
2. Their reactions were noted; and
3. Discussions were held with them.

Thus, suggestions were slowly collected for improving the design. Three instances of unhelpful inconstancies came to notice.

1. In most of the subjects, the Personality Facet preceded the Problem Facet;
2. This gave satisfaction to the readers; and
3. But, in the compound subjects going with main subjects, "2 Library Science", "E Chemistry," and "Z Law", the sequence fixed was the reverse – Problem preceded Personality.

In readers coming to the shelves containing books on these subjects, we could observe a sense of dissatisfaction in their faces

## 4. INCONSISTENT USE OF DIGITS

One and the same digit was used to denote totally different and unequivalent ideas in a few different schedules. Equivalent ideas were represented by different digits in different schedules. The readers did not observe this; but it was most irritating to us.

## 5. ATTEMPT AT A THEORY OF CLASSIFICATION (1933 TO 1937)

These and other inconsistencies led us to realize that where a design is not done in the light of cent percent intuition, but only intellectually, the work should be regulated by a set of agreed, definitely formulated, intellectual Principles for Guidance. But, the history of subjects shows that any work has to begin by trial and error only. It is only after gaining some experience with trial and error method, Guiding Principles are usually evolved. According to a well known saying, "Poetry first prosody afterwards." This is true in all subjects. It has been true in the design of CC too.

By 1935, the time was ripe to work out a Theory of Classification. The result of this work was the *Prolegomena to library classification,* **Ed 1 (1937)**

## 6. DESCRIPTIVE STATIC THEORY

No doubt, there has been some theory written earlier by E. C. Richardson, W C Berwick Sayers, and H. E. Bliss. But these theories consisted of canons, mostly descriptive of the existing schemes. These did not have much of a dynamic quality capable of leading to a Theory for the Design of a Scheme for Classification, of the ever extending and ever deepening Universe of Subjects. Prolegomena Ed 1 (1937) too has suffered from this defect except for the canons of

Consistent Sequence (See Sec AH3134 Relativity (See Sec AH3313)

Currency (See Sec AH323) Mnemonics (See Sec AH332)

Enumeration (See Sec AH322) View Point

Context (See Sec Ah321) Classics, and

Reticence (See Sec AH324) Distinctiveness

 (See Sec H343)

This set of canons had something dynamic in them. The canon of View Point has now been generalised into Phase Relation (See Chap DN), and that of Classics has been changed into Classic Device (See Chap CZA)

## 7 CORRECTION OF CC WITH THE AID OF THE CANONS

With the aid of the Canons, several of the inconsistencies in CC, Ed 1, were removed, and Ed 3 was brought out in 1939.

## 8 Diversion of Thought (1940 to 1946)

By 1939, the combined effect of the local conditions caused by World War II, and the adverse local political forces, virtually sapped away much of the creative energy. Therefore, mind was diverted from the continuation of the work of a Dynamic Theory of Classification. However, authorial work was not altogether abandoned. Books were written on other subjects of a less exacting nature namely,

1. Reference Service
2. Bibliography
3. School and College Library work
4. Classification Practice and
5. Cataloguing Practice.

These were all based on actual experience. In fact, the writing of a books on these subjects, took away to some extent, the pain caused by adverse local conditions.

In 1945, migration from Madras to Banaras became necessary. There, are enormous amount of routine work was needed for reclassification and for reorganization. This was to be done without the help of trained staff. The generally prevailing atmosphere in the University the revival of work of a creative kind was not conducive.

## 81 RESUMPTION OF UNINHIBITED WORK

Resumption of work on the Theory of Classification was possible only after going to Delhi on 17 June 1947. This was at the kind invitation of Sir Maurice Gwyer, the Vice Chancellor of the University of Delhi, and retired Chief Justice of India. He sent the invitation in an affectionate letter, after hearing of the inhibiting forces working on me for some years.

## STIMULUS TO THE DEVELOPMENT OF THEORY (1947 to 1961)

**1.      Proliferation of Subjects**

Between 1925 and 1950, the proliferation of subjects had increased. Books came to be written on subjects of greater depth than before.  CC had to face this problem.  To meet this demand and similar future needs, the Theory of Classification of 1937 had to be deepened and made more dynamic.  Opportunity to do this came in five ways after my going to Delhi in 1947.

1.  I had no administrative work;
2.  The whole time could be devoted to research and teaching;
3.  Sir Mautice Gwyer instituted the M. Lib. Sc. Degree and this provided a great stimulus to research;
4.  Delhi had an appreciable number of my old students willing to work with me in their leisure hours; and
5.  By his kindness, Sir Maurice Gwyer provided a stimulating atmosphere for team research.

This continued in a large measure till Gwyer's leaving Delhi in 1950  and myself leaving in 1955.  As the President of the Indian Library Association, I organized a Library Research Circle.  It used to meet in my house every Sunday afternoon.  In addition to this, the more intimate members and myself were utilizing our daily morning walks in pursuing diverse problems in this subject, among others.  In 1949, the quarterly *Abgila* was started as a medium for exchange of ideas developed by research in Library Science.

**2. Difficulty Due to Predetermined Facet Structure**

One of the difficulties met with is illustrated below:

1. "Designing in Electrical Engineering" had to be given the Class Number D66: : : 4,  as the two intermediate facets " Secondary Work" and "Part" - - were not present in the subject.
2. If  two of the colons had not been put, the Class Number would have been D66: 4. And this would have represented "Transmission of Electricity".

This was due to the predetermined rigid facet structure for every Compound Subject going with the respective Basic Subjects.

## 3   FIVE FUNDAMENTAL CATEGORIES

A way out of this difficulty was found by developing a Theory of Classification.  This development consisted of the Postulate of Five Fundamental Categories.  According to this Postulate, each isolate facet in a Compound Subject  (CS) should be deemed to be a manifestation of one and only one of one or other of the Five Fundamental Categories (FC) – Personality, Matter, Energy, Space, and Time (PMEST).  Each facet was given a separate Indicator Digit:

| FC | Indicator Digit |
| --- | --- |
| Personality | , (Comma) |
| Matter | ; (Semi Colon) |
| Energy | : (Colon) |
| Space | . (Dot) |
| * Time | . (Dot) |

The respective ordinal values of the Indicator Digits were so fixed as to throw them in the above decreasing sequence.  Further, their ordinal values were all taken to be smaller than that of any substantive Digit used in CC.  This solved the problem.  This ideas was incorporated in CC, Ed 4 (1952) and in the Prolegomena, Ed 2 (1957)

## 4   INTERPOLATION OF NEW MAIN SUBJECTS

The substantive Digits available for use in the Array of Order 1 (Array of  (MS) ) of the CC were limited – eight Indo-Arabic numerals and the 26 Roman capitals.  Therefore, need arose for finding new digits so as to interpolate new (MS) appearing from time to time, and Partial Comprehensions (MS) in their respective helpful places.  Finding a final solution to this problem had to be postponed, on account of there being many other more pressing problems needing immediate attention.  Therefore, Greek letters of appropriate phonetic values were temporarily improvised.  For example, the Greek Letter Lamda represented "Animal Husbandry"  providing for its place between "K Zoology" and "L Medicine," This

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*   In 1959, the Indicator Digit for Time was changed to –'- (Single inverted comma), at the suggestion of P. B. Roy, Librarian of  the Commercial Intelligence and Statistics Library, Calcutta, who came to Bangalore and worked with me on classification for a short period.  This increased the versatility of the notational system.

provisional arrangement was continued till 1963, when the reprint of CC Ed 6 (1960) was produced. In this reprint, the Greek letters were replaced by Roman letters and a few other new ideas were introduced.

## 5  EXTRAPOLATION

Need was felt for extrapolation at the end of each species of digits – Roman smalls, Indo-Arabic numerals, and Roman capitals. A simple solution was found for this. The last digit of each species was postulated to be Semantically Empty but to retain its Ordinal Value. Thus, the semantically rich member after the digit "8", is the digit pair "91". The digit "8" and the digit pair "91" are coordinate in their array. The digit pair "91"is treated as if it were a single digit. The idea was incorporated in the *Prolegomena*, Ed 2 (1957). However, this use of the digit "9" had occurred unconsciously in some arrays even in CC, Ed 2 (1939). We can have as many sectors as we like at the end of each of the three species of digits. However, as this device was used in the earlier years only in respect of Indo Arabic numerals and each of its sectors had only eight semantically rich digits, it was called "Octave Device". It is now called "Sector Device." UDC accepted this device in 1954. From Ed 17 onwards DC is also using it.

## 6  THREE PLANES OF WORK AND THEIR SEPARATION

All along, the notational system had been imposing a limitation on practically all the schemes. This was a great handicap. Removal of this handicap was investigated theoretically between 1952 and 1957. The result was the separation of the work in the Idea, Verbal, and Notational Planes respectively. It was also decided that the work in the Idea Plane was paramount. It should march forward according to the ever-increasing demands of the Universe of Subjects. It was the duty of the Notational Plane to implement, in full measure, every increasing demands of the Universe of Subjects. It was the duty of the Notational Plane to  implement, in full measure, every finding in the Idea Plane. This led to continued work in the Notational Plane, so as to increase its versatility. Further, to remove the cloud thrown round the Idea Plane, by the use of common words in the schedules, the use of agreed technical terminology in the schedule was brought into vogue. These results were incorporated first in the *Prolegomena* of Ed 2 (1957) and later in Ed 3 (1967).

**7    CO-OPERATION OF THE INTERNATIONAL FEDERATION FOR DOCUMENTATION (FID)**

The theoretical investigation since 1957 was stimulated to some extent by FID.  In October 1947, FID asked me to contribute a paper on "Classification and International Documentation."  A few months later, FID invited me to the 1948s FID Congress, at the Hague.  I was asked to give an exposition of the Theory of Faceted Classification, developed in India till then.  In 1950, FID created its Committee on the General Theory of Classification (FID/CA) and invited me to become its  Rapporteur General.  I continued in this capacity till 1961.

This stimulated research in the theory.  The annual reports submitted to FID/CA were discussed at its Annual Meetings.  When FID/CA was replaced in 1962 by FID/CR (Committee of FID on Classification Research), I was invited to be the Honorary Chairman of the latter for life.

**8   STIMULUS BY INTERNATIONAL CONFERENCES ON CLASSIFICATION**

On the initiative of FID/CA and its successor FID/CR two International Study Conferences on Classification have been held – one at Dorking in 1957 and the other at Elsinore in 1964.  On both  these occasions, I was invited to open the Conference and to participate in its work.  This provided an opportunity to discuss the subject with a large number of colleagues coming from different countries.  The discussions led to the formulation of further problems for research.  This gave stimulus to the further development of  a Dynamic Theory of Classification.

## TEAM RESEARCH IN THEORY OF LIBRARY CLASSIFICATION (1962 onwards)

### 1    ESTABLISHMENTS OF RESEARCH INSTITUTE

The year 1962 forms an important epoch in the development of a Dynamic Theory of Classification and of CC.  In that year, Professor P. C. Mahalanobis F R S, a member of the Planning Commission in charge of Perspective Planning, persuaded the Indian Statistical Institute to establish the Documentation Research and Training Centre (DRTC) in Bangalore. This was done with the concurrence of the Union Government.  His chief reasons for doing this were:

1.  In order to make industrialization of India would become truly productive, if and only if it was no longer based  on imported results of research and know-hows but was actively supported by indigenous research and design of  know-how.

2.  Progress in industries will not  be possible if based on only results of foreign research and know-hows.

3.  An efficient and concurrent documentation work and service would not be possible, unless supported by continuous improvement in documentation techniques.

4.  Inspite of documentation having practised in the Western countries, even before India's Independence and industrialization, the documentation methods developed in those countries were  based largely on trial and error  method; on the other hand.

5. Since 1935 India has been developing a Dynamic Theory of Classification found fit to form the foundation for efficient documentation.

6. After India's Political Independence, India had boldly entered into research in the field of documentation of nascent micro-documents; and therefore,

7. Independent India owes it as a duty to itself to strengthen and provide for further research in documentation on a permanent basis by establishing a Research Institute for Documentation.  The generous statesmanly outlook of Pandit Jawaharlal Nehru gave full support to this proposal.  At the request of Prof Mahalanobis, I organized the DRTC in Bangalore, as a wing of the Research and Development Department of  the Indian Statistical Institute.

### 2    BLENDING OF METHODS OF RESEARCH

Since the establishment of the DRTC, great strides have been taken in improving the Dynamic Theory of  Classification put in ?. These are in ordinary classification at book level, and in depth classification at the level of nascent micro documents, papers in periodicals and

parts of books.  Apart from many results in the theory, about 100 depth schedules have been designed for the classification  of microdocuments in some specialist subjects. To publish these schedules and the results of research, two periodical publications are being maintained.

1.  The proceedings of the Annual Seminar of DRTC (1963-), and

2.  The  quarterly *Library Science with a slant to Documentation* (1964) sponsored jointly by the DRTC and the Sarada Ranganathan Endowment for Library Science.   One of the outstanding features of the research done in this DRTC is the continuous blending of the methods of pure  research and of pragmatic  research.  This conscious  blending of the methods leads to developmental research and quickly yields reliable results.

    A.  A systematic account of the subject will be found in R.S.Parkhi's Library Classification: Evolution of Dynamic Theory (1972), forming the Sarada Ranganathan Lectures,  1968.  (Sarada Ranganathan Endowment  for Library Science Series, 2)

## 3   WORK IN THE IDEA PLANE

The work in the Idea Plane has been completely freed from the work in the Notational Plane.  This has enabled the work in the Idea Plane to spread out its wings, so to speak, to their fullest extent.  This opened up a flood gate for research in the Idea Plane,  In its turn this enables the Dynamic Theory of Classification to keep step continuously with the rapid changes in the Universe of Subjects.   This has now become a truly turbulent dynamic continuum.  Some of the areas in which research is in progress are :

1.  Clearer concept of Basic Subject and the recognition of different kinds of Basic Subject;

    11  Systems of thought of a (MS)

    12  Study of subjects in extra-normal environmental conditions such as Environmental Engineering, High Altitude Physiology and Economics in Developing Countries; and

    13. Study of (MS) within a specified restricted range such as Physics of Low Pressure, Child Medicine, and Small Scale Industries;

2.  Fusion as a method of forming new (MS);

3.  Refinement in the concept of the manifestation of the (FC);

4. Development and exploitation of the concepts of Compound Basic Subjects and Compound Isolates with their respective components;

5. Aid of statistical concepts in developing a general Theory of Classification.

Research in the Idea Plane is for classification in general and not for any particular scheme.

## 4    WORK IN THE NOTATIONAL PLANE

To enable the Notational System to implement all the findings of the Idea Plane, without any inhibition, research in the Notational Plane has become a necessity.   The DRTC Research Team has  been actively engaged in this work.  It has already produced many useful results.  The Notational System should develop the versatility, necessary to meet any demand of the Idea Plane.  This had been completely overlooked in the past.  Indeed, it was not unusual for people to decry any research in the Notational Plane.  " Our country will not agree to Mixed Notation"; "Our country will tolerate only the Simple System of Indo-Arabic numerals" – such are the samples of allergy even in persons who accept the necessity for a Freely Faceted Classification in so far as the Idea Plane goes.  But this does not appear to be a healthy or scientific attitude.  It is particularly so on account of the increasing demand by the classification of nascent Micro Documents. The Universe of Micro Subject is proliferating at a great rate.  This cannot be met without research in the Notational Plane.

## 5.   AREAS COVERED BY WORK IN DRTC

Research in the Notational Plane can in general be only with reference to the notational system of particular scheme for classification.  The work in DRTC is in respect of the notational system of CC.  But some of the ideas behind the results obtained may be of use to other schemes also.  For example the Concept of Octave Notation developed for CC before 1950 has been accepted by UDC and to some extent by DC (See Sec AD5) The areas of research in the Notational Plane covered after 1963 are:

1. Notational Devices for Extrapolation and Interpolation in any array among the facets presented by compound subjects :

2. Notational Device for formation of Compound Facets; subjects going  with any Basic Subjects.

3. Enlargement of the base of the notational system.   All such matters are fully described in relation to the notational sytem of CC in Chap CH.

# FREELY FACETED VERSION OF COLON CLASSIFICATION

## 1. RESULTS OF THE THEORY OF CLASSIFICATION

One of the chief results of the Dynamic Theory of Classification developed till now, may be briefly stated as follows:- It has taken a Scheme for Classification from an Enumerative one, through a Rigidity Faceted one, to a Freely Faceted one.

## 2. AUXILIARY SCHEDULES

In this discussion, we may ignore the few auxiliary schedules found practically in all the schemes for classification – DC, EC, UDC, LC, and BC. We may also do similarly with the schedules of analytical subdivision given for certain subjects in UDC.

## 3. ENUMERATIVE CLASSIFICATION

Each of the above mentioned schemes consists essentially of a long main or ' Core Schedule' as it may be called. The core schedule enumerates the current and also all anticipated subjects with their respective Class Numbers. They are mostly Compound Subjects. LC has the longest core schedule. The number of Compound Subjects enumerated in DC and UDC is about 17,000. This is far too small a number to cover the Universe of Subjects throwing forth many new Compound Subjects, continuously and at a fast rate. An Enumerative Scheme is therefore obliged to lag behind and give up providing co-extensive Class Numbers to many new Compound Subjects. One example of this predicament of DC will be found at the end of Step 7.

## 4. VALIANT ATTEMPT OF UDC

However, UDC gets over this kind of difficulty by the use of " Analytical Divisions" in many cases. In case of this being impossible it valiantly gets over the difficulty with the aid of " Coloned Numbers"—that is, combining two Compound Class Numbers with the digit ":" (colon) as the connecting digit. This valiant attempt of UDC is an indication of the soundness to the theory, " the Class Number should individualise and be co-extensive with the subject, whatever be its depth." But its solution is often of a desperate kind. This is due to UDC having first accepted the long DC core of Compound Subjects. The UDC has still this handicap in spite of changing its schedule of enumerated compound subjects. This will not happen if the UDC breaks up each of these Compound Subjects into its Basic Facets and

Isolate Facets. But the beginning of the twentieth century was too early for this new way of building Class Numbers of Compound Subjects to have suggested itself.

## 5. ANALYTICO-SYNTHETIC CLASSIFICATION

As stated in Sec AA4 and AA5, the inability of an Enumerative Classification such as DC – giving a single schedule of all possible Compound Subjects – to provide co-extensive Class Numbers to new Compound Subjects, led CC to find an alternative approach to the design of a scheme for classification applicable to the ever-growing Universe of Subjects. This alternative approach has led CC to give:

1. One Schedule of Basic Subjects:

2.      Nine auxiliary Schedules of Common Isolates; and

3. A set of Schedules of Special Isolates for use in the Compound Subjects going with the respective Basic Subjects – a different set for each Basic Subject.

All these schedules are short except the schedule of space isolates. Enumeration is restricted only to these short schedules. The number of enumerated schedules is expected to be about 100 in Ed 7 (1974).

With these enumerated schedules, the number of subjects capable of being provided with co-extensive Class Numbers is many hundred times larger than the 17,000 of DC. To get this advantage, practical classification cannot be as simple as looking up the index and if necessary looking up the relevant page of the core schedule. On the other hand,

1. The subject should be analysed into Facets in the Idea Plane;

2. Each Facet Term should be replaced by its Facet Number; and

3. Facet Numbers should be Synthesized in the Notational Plane. In 1934, this process of synthesizing led H. E. Bliss, coin the term 'Synthetic Scheme.' But the fully expressive term ' Analytico-Synthetic Scheme' was suggested later in 1948 by A. J. Wells. Another name used to describe CC is 'Faceted Scheme'.

## 6. RIGIDLY- FACETED SCHEME

Between 1924 and 1949, several new Compound Subjects had been thrown forth by the Universe of Subjects, challenging the capacity of CC. According to an analysis of the challenge the fault was traceable to a predetermined Facet structure imposed on all the Compound Subjects going with a specific Basic Subject. This pre-determination forced an overgrown Compound Subject into the Procrustean Bed of such a facet. A Rigidity Faceted

Scheme was often found to be as bad as DC.  Chapter AC, about 15 years of theoretical investigation led to the postulation of the Five fundamental Categories and other postulates and principles.  This reduced the rigidity of CC to very a large extent.

## 7.  FREELY FACETED CLASSIFICATION

But during the period 1962 to 1966 the deeper cause for the rigidity of the earlier versions of CC was traced out.  It was due to the wrong belief that the facets belonging to the Basic Subjects.  But according to the present idea they belong only to each Compound Subject.  No doubt, a Basic Facet is a necessary Facet.  Thus a Compound Subject may bring any number of Isolate Facets. We should identify each of them.  In the process of the Analysis in the Idea Plane, we should transform their sequence into the sequence suited to the syntax of the Notational Plane that is of the preferred ordinal language.  This is similar to a preliminary transformation in translating from one natural language to another (Step 31 in Sec. BB5). CC is now able to do this.  It does not force any particular facet on any Compound Subject. Nor does it ignore and throw away any particular facet from any Compound Subject for reasons of its own inability to accommodate it in the Class Number as a result of the fault in the Notational Plane on the other hand, it fully respects the freedom of a Compound Subject to bring in any number of every kind of facet.  It also gives similar freedom to Complex Subjects to bring in any number of any kind of phase.  In this way, the version of CC Ed. 7 has gained the status of a "Freely Faceted Library Classification." To gain this status, CC has had to refine its analysis in the Idea Plane.  It also had to increase the versatility of its Notational System.

## 8.  IS THERE NO  RESIDUAL RIGIDITY ?

Any residual rigidity left in CC, should be lurking behind the Principles for Facet sequence.  (see Sec AH6) Then, these principles may fail to give helpful sequence.  But according to Chap XJ of the *Prolegomena,* Ed 3 (1967), the Principles of Facet Sequence respect the Absolute Syntax of facet, as found in the present day mode of thinking of a human intellect.  A  method for checking up this assumption has also been suggested in that chapter.  In case of  assumption being true, trouble due to rigidity will arise, only under one condition, the present mode of thinking gets mutatated, calling for a different pattern of Absolute Syntax.  Further, the apparent rigidity imposed by the Absolute Syntax is essential.

For, otherwise, the sequence of Compound Subjects will prove to be like a "river without banks."

## 81  ANALOGY FROM THE RAMAYANA

The Ramayana describes that the river Ganga was trained to follow King Bhagiratha along the route being carved out by him in advance to sense and to meet ever-changing, needs of the Universe of Subjects.

## DEPTH VERSION OF COLON CLASSIFICATION FOR DOCUMENTATION

### 1.  GENESIS OF THE IDEA

A study of the document-needs of specialists in the industries of USA in 1950, the association with the International Federation for Documentation (FID) since 1947, and having charge of the FID/CA (Committee on the General Theory of Classification of the FID) since 1951, led to the realization of the following :

1. Failure to take up the responsibility of serving : The Library profession would be failing in its duty to specialist  readers, with all the relevant nascent Micro Documents in their respective subjects, would lead to the library profession failing in its duty, to fulfil law 2 of Library science;

2. The discharge of the documentation responsibility required the use of the Depth Version of the Colon Classification, and indeed of any scheme for Classification; and

3. The design of the Depth Version of any scheme for Classification should be a continuing process; and

4. It should depend upon a Dynamic Theory of Library Classification capable of keeping step with the un-ending and un-anticipatable developments in the Universe of subjects.

### 4.  PLAN OF 1952:  VOLUME 1

Accordingly, in 1952, it was intended to publish Ed 4 of CC in 2 volumes.  Vol. 1 was to contain just what was necessary for classification at book level.  It is being continued in later editions, including the present one, with such additions as the newly emerging Literary Warrant at book level and the needs of generalist readers require.

### 3   PLAN OF 1952: VOLUME 2

Vol. 2 was intended to give the Depth Versions of the CC for different specialised subjects, in successive fascicules.

### 3   ERROR IN JUDGEMENT

Till about 15 years later, it had not brought out fascicule of Vol. 2.  For, in 1952, the experience was meagre to realise the implications of building Depth Schedules for diverse special subjects.  The implications are as follows:

1.   A methodology has to be devised for the design of the Depth Version of a scheme for classification.  This will demand for Compound Subjects, a freely-faceted structure, with a large number of Facets and the sharpening of the Isolates in any Facet to a considerable degree;

2   A good abstracting periodical has to be continuously scanned, and whenever necessary, the help of a specialist has to be taken in order to sense the Micro Subjects being newly formed; and

3   The absence of economic viability in the publication of the fascicules of Depth Versions for the respective special subjects will make their publication difficult, on account of the demand for such fascilcules being very limited.

**After the Establishment of DRTC**

Since the establishment of DRTC in 1962, the difficulties mentioned in Sec. 4 are being slowly overcome as follows:

1.   Since November 1962, teaching the subjects, to the DRTC inmates at a deep level, gave a considerable help;

11.   A better insight was gained in the understanding of the Postulates regarding the Five Fundamental Categories – Personality, Matter, Energy, Space, and Time (PMEST);

12.   Further, the formulation of the versatile Wall-Picture Principle has proved to be an aid, in most of the cases in determining in a consistent way a helpful sequence among the Facets of a Compound Subject, and also among the Isolates in a Schedule and in each array of it;

13.   The useful device of forming Compound Isolates and Compound Basic Subjects has been formulated;

14.   In this connection the concept of Special Component has been developed;

15.   The concept of Empty, Emptying, and Empty-Emptying Digits has been formed, in order to provide for interpolation and extrapolation of Main Subjects and of Space Isolates in the respective Arrays;

16.   The versatility of the Notational System of CC has been increased to a great extent by eliminating most of the wastage of digits persisting all along;

2   The teachers and the inmates of the DRTC systematically scan the abstracting periodicals in each specialised subject, having an immediate demand for Documentation in India, and to take the help of specialists in their respective subjects to the extent necessary; Thus,

21   They bring to surface new Micro Subjects arising out of the horizon;

3   The uneconomic idea of publishing fascicules of Depth Schedules as constituents of Vol. 2 of the CC has been given up;

They are now being published in the two periodical publications:

1.  Library science with a slant to documentation (Lib Sc) jointly sponsored by the Sarada Ranganathan Endowment for Library Science and the DRTC; Vol.1 ---; 1964 ---; and

2.  Annual seminar, DRTC (Annual Seminar, DRTC) V1 --; 1963 --.

A few schedules had also been published earlier in the Annals of library science (An lib sc) V1-10; 1954-1963.

## 6. PROGRESS IN THE PREPARATION OF DEPTH VERSIONS OF COLON CLASSIFICATION

Sec. 8 gives a list of the subjects already provided with schedules for Depth Versions. The list includes also 20 unpublished schedules.

## 7   NEED FOR CONTINUED REVISION

Depth Scheducles should generally be taken to be much more provisional than the Basic Schedules for books. For, they will have to be revised more frequently, than the Basic Schedules, in the light of the,

1.  Formation of new Micro Subjects;

2.  Improvements in the Theory of Library Classification; and

3.  Resulting changes and improvements in the schedules.

7.  List of Depth Versions of COLON CLASSIFICATION

29

| SN | Class Number | Subject | Author | Where published (Either the Paper numbers inclusive pages are given) |
|---|---|---|---|---|
| 1. | a | Generalia bibliography | Ranganathan (S.R.) and Neelameghan (A) | An lib sc. 10; 1963; D |
| 2. | w | Personal bibliography | Ranganathan (S R) and Neelameghan (A) | Ann.sem,DRTC.3;1965; H |
| 3. | 2 | Library Science | Bhattacharyya (G) and Bhattacharyya (M) | Ann sem, DRTC. 4 1966; N |
| 4. | 2 | Library Science | Ranganathan (S R) | Lib Sc. 7; 1970; J |
| 5. | 2;51 | Library classification | Ranganathan (S R) | An lib sc. 7; 1960; 65-76 |
| 6. | 2;51 | Library classification | Kidwai (A H) | Unpulished |
| 7. | 2;55 | Library cataloguing | Ranganathan (S R) | An lib sc. 8; 1961; 35-41. |
| 8. | 2;51 | Library classification | Bhattacharyya (G) | Ann sem, DRTC 5; 1967; F |
| 9. | 3 | Book science | Ranganathan (S R) | Lib sc. 1; 1964; F |
| 10. | 8 | Management | Ranganathan (S R) | An lib sc. 3; 1956; 33-85 |
| 11. | 2;51 | Library classification | Upadhyaya (P D) | Unpublished |
| 12. | 8;y | Personnel Management | Ranganathan (S R) | Unpublished |
| 13. | 95,8 | Programming language | Ravichandra Rao(I K) and Rawat (K) | Lib sc. 9; 1972; B |

| SN | Class Number | Subject | Author | Where published (Either the Paper numbers inclusive pages are given) |
|---|---|---|---|---|
| 14. | BT93 | Statistical quality control | Harjit Singh | Unpublished |
| 15. | C5 | Radiation physics | Subramanian (T V) | Unpublished |
| 16. | C5 | Radiation physics | Revanna Siddappa | Unpublished |
| 17. | D41 | Highway engineering | Raghavan (MC) | Unpublished |
| 18. | D44 | Bridge engineering | Sabade ( M R) | Unpublished |
| 19. | | Air Vehicle Wing | Neelameghan  (A) and Ranganathan (T) | Lib. Sc. 7; 1970; C |
| 20. | | Motor vehicle | Neelameghan  (A), Gopoinath (MA) and Denton (P H) | Lib. Sc. 4; 1966; P |
| 21 | | Locomotive | Neelameghan (A) and Bhattacharrya (G) | Lib Sc. 3; 1966; P |
| 22. | | Aircraft | Ranganathan (T) | Unpublished |
| 23. | | Helicopter | Basu (H) | unpublished |
| 24. | | Missile | Anjaneyulu (V) | Ann sem, DRTC, 3; 1965; K |
| 25. | | Screw | Adbul Rahman Afroze Fathima, and Ranganathan (T) | Lib. sc. 1; 1964; B |
| 26. | | Nut | Ranganathan (T) | Lib. sc.1; 1964; G |
| 27. | | Bearing | Ranganathan (T) | Lib sc. 1; 1964; M |
| 28. | | Gear | Ranganathan (T) | Lib. sc. 3; 1966; B |
| 29. | | Spring | Ranganathan (T) | Ann sem. DRTC,3; 1965; J |
| 30. | | High vacuum pump | Malhotra (VK) | Unpublished |
| 31. | | Air compressor | Thomas (J T) | Unpublished |
| 32. | | Furnace | Chakraborti (A K) | Ann sem, DRTC. 5;1967;G |
| 33. | | Boiler | Neelameghan (A) and Gopinath (M A) | Ann sem, DRTC. 3; 1965; L |

| SN | Class Number | Subject | Author | Where published (Either the Paper numbers inclusive pages are given) |
|---|---|---|---|---|
| 34. | | Reciprocating internal combustion engine | Ranganathan (S R). Neelameghan (A) and Gopinath (M A) | Lib. sc.2;1965; B |
| 35. | | Gas turbine engine | Ranganathan (T) | Ann sem, DRTC, 2;1964; 1.4 |
| 36. | | Chemical rocket engine | Vasudeva Rao (K N) | Ann sem, DRTC. 4; 1966; Q |
| 37. | | Voltaic Cell | Subramanian (P V S) | Unpublished |
| 38. | | Electric Motor | Gupta (B L) | Unpublished |
| 39. | | Electron tube | Parthasarathy (V V) | Ann sem, DRTC. 3; 1965; N |
| 40. | | Semi-Conductor diode and transister | Nagarathna (R A) | Ann sem, DRTC. 3; 1965; P |
| 41. | | Transistor | Gundu Rao (D) | Ann. sem, DRTC 2; 1964; 1.5 |
| | | Transistor | Mari Gowda (A B) | Unpublished |
| 42. | | Radar | Ramananda (B S) | Ann sem, DRTC; 2; 1964; 1.6 |
| 43. | | Laser | Ramananda (BS) and Anjaneyulu (V) | Ann. sem, DRTC 4; 1966; R |
| 44. | | Nuclear reactor | Raghavendra (MK) | Ann sem; DRTC; 3; 1965; N |
| 45. | | Particle accelerator | Gupta(A B) | Unpublished |
| 46. | | Computer | Anjaneyulu (V) | Ann sem, DRTC; 5; 1967; H |
| 47. | | Lathe | Gopinath (M A) | Lib. sc.8;1971;k |
| 48. | | Antenna | Aloraham (M A) | Unpublished |
| 49. | | Incandescent lamp | DRTC trainees | Unpublished |
| 50. | | Radio receiver | Devadasan (F J) | Unpublished |
| 51. | | Corrosion | Chitnis (M) | Unpublished |
| 52. | | Metallurgy | Chakraborti (A K) | Unpublished |

| SN | Class Number | Subject | Author | Where published (Either the Paper numbers inclusive pages are given) |
|---|---|---|---|---|
| 53. | | Technology of food | Neelameghan (A) and Sangameswaran (SV) | Lib. sc. 7; 1970; L |
| 54. | | Meat | Gopinath (M V) | Unpublished |
| 55. | | Refractory material | Gupta (A K) | Ann sem, DRTC. 5; 1967; K |
| 56. | | Ceramics | Bavadekar (P N) | Unpublished |
| 57. | | Glass | Neelameghan (A) | Lib.sc.5; 1967; L |
| 58. | | Natural Rubber | Nair (V K G) | Unpublished |
| 59. | | Plastics | Bhide (M G) | Unpublished |
| 60. | | Man-made fibre | Shah (P R) and Chitra Krishnamswamy | Ann sem, DRTC. 6; 1968; BE |
| 61. | | Leather | Eswara Reddy (DB) | Ann sem, DRTC. 6; 1968; BF |
| 62. | FV | Foundry | Jayarajan (P) | Unpublished |
| 63. | | Biology of steriods | Mitra (Priti) | Unpublished |
| 64. | GT | Cytology | Krishnamurthy (P G) | Unpublished |
| 65. | J,431 | Coffee Cultivar | Lakshmanaswamy (MG) | Ann sem, DRTC. 2; 1964; 1.7 |
| 66. | J,452 | Tobacco Cultivator | Raja Rao (D Ch) | Ann sem. DRTC. 3; 1965; S |
| 67 | J,711 | Rubbercultivar | Goonetileke (S C) | Ann sem. DRTC. 4; 1965; S |
| 68. | KX;6 | Animal breeding | Chandrasekara Sastri (K) | Unpublished |
| 69. | L;2 | Human anatomy | Seetharama (S) | Unpublished |
| 70. | L;4 | Disease (in medicine) | Seetharama (S) | Lib. sc.8; 1971; R |
| 71. | L;4;35 | Diagnositic radiology | Ranganathan (SR). Neelameghan (A) and Gopinath (MA) | Lib. sc. 2; 1965; G |

| SN | Class Number | Subject | Author | Where published (Either the Paper numbers inclusive pages are given) |
|---|---|---|---|---|
| 72. | L;4;65 | Therapeutic radiology | Ranganathan (SR) Neelameghan (A) and Gopinath (MA) | Lib. sc.2; 1965; G |
| 73. | LX3 | Pharmacology | Ranganathan (S R) and Neelameghan (A) | Lib. sc. 1; 1964; L |
| 74. | LX3,C5 | Effect of nuclear Radiation, Pharmacology | Mukherjee (SC) | Unpublished |
| 75. | LY5 | Public Health | Rajani Ahuja | Unpublished |
| 76 | MP85 | Fountain pen production | Bavadekar (PN) | Unpublished |
| 77. | O,152,1 | Hindi poetry | Sharma (N K) | Ann sem, DRTC, 6, 1968;Bh |
| 78. | O,31,1 | Tamil poetry | Ranganathan( S R) Thillainayagam (V) | An lib sc. 10; 1963; P |
| 79. | S | Psychology | Sinha (M P) | Unpublished |
| 80. | T;3 | Teaching technique | Mahajan (S G) | Unpublished |
| 81. | V;15 | Foreign policy, History | Wasan (R P) | Ann sem, DRTC.4; 1966;T |
| 82. | W | Political science | Chayadevi (A) | Unpublished |
| 83. | W';15 | Foreign Policy, Political science | Wasan (R P) | Ann sem, DRTC, 4; 1966;T |
| 84. | w,691 | Communism | Sanyal (TK) | Unpublished |
| 85. | X62 | Banking | Neelameghan (A) | Unpublished |
| 86. | X,65 | Investment | Neelameghan(A) | Lib.Sc.8; 1971;C |
| 87. | X,72 | Taxation | Neelaemghan (A) | Lib.sc.8;1971;F |
| 88. | X,95 | International Trade | Neelameghan (A) | Lib.sc.8,1971;L |
| 89. | XX,D74 | Transport economics | Neelameghan (A) and Gopinath (MA) | Lib Sc. 7; 1970; P |
| 90. | XYT | Econometrics | Sambamurthi(N) | Unpublished |
| 91. | Y | Sociology | Mukherjee (BP) | Unpublished |
| 92. | YX | Social Work | Kumedan(BS) and Parkhi(RS) | Ann sem. DRTC.5; 1967;M |

# LIST OF NORMATIVE PRINCIPLES

## 0   INTRODUCTION

The theory governing the design and the use of scheme for Library Classification is given in my *Prolegomena to Library Classification,* Ed. 3 (1967).  CC follows this theory.  A list of the normative principles explained in that book is given here for ready reference.  Except in Sec. 5, the part, chapter, or section number given within brackets at the end of the collective and the individual names of the normative principles, is the number of the part, chapter, or section in the *Prolegomena*, in which that principle is defined, explained and illustrated.  In Sec 5 the reference is to this book itself.

## 1   GENERAL LAWS

    11   Laws of Interpretation (Chap DC)

    12   Laws of Impartiality (Chap DD)

    13   Law of Symmetry (Chap DE)

    14   Law of Parsimony (Chap DF)

    15   Law of Local Variation (Chap DG)

    16   Law of Osmosis (Chap DH)

## 2  LAWS OF LIBRARY SCIENCE

    21   Books are for Use (Sec DB1)

    22   Every Reader His book (Sec DB2)

    23   Every Book Its Reader (Sec DB3)

    24   Save the Time of the Reader (Sec DB4)

    25   Library is a Growing Organism (Sec DB5)

## 3  Canons of Classification

31    Canons for Work in the Idea Plane (Part E)

311   Canons for characteristics (Chap EB, EF)

3111 Canon of Differentiation (Chap EC)

3112 Canon of Relevance (Chap ED)

3113 Canon of Ascertainability  (Chap EE)

3114 Canon of Permanence (Chap EF)

312 Canons for Succession of Characteristics (Chap EG/EK)

3121 Canon of Concomitance (Chap EH)

3122 Canon of Relevant Succession (Chap EJ)

3123 Canon of Consistent succession (Chap EK)

313   Canons for Array (Chap EL/EQ)

3131 Canon of Exhaustiveness (Chap EM)

3132 Canon of Exclusiveness (Chap EN)

3133 Canon for Helpful Sequence (Chap EP)

3134 Canon of Consistent Sequence (Chap EQ)

314 Canons for Chain (Chap ER/ET)

3141 Canon of Decreasing Extension (Chap ES)

3142 Canon of Modulation (Chap ET)

315   Canons for Filiatory Sequence (Chap EU)

3151 Canon of Subordinate Classes (Sec EU1)

3152 Canon of Co-ordinate Classes (Sec EU2)

32 Canons for Work in the Verbal Plane (Part G)

321 Canon of Context (Chap GB)

322 Canon of Enumeration (Chap GC )

323 Canon of Currency (Chap GD)

324 Canon Reticence (Chap GE)

33 Canons for Work in the Notational Plane (Parts J/L)

331 Basic Canons for Notation (Part J)

3311 Canon of synonym (Chap JB)

3312  Canon of Homonym (Chap JC)

3313 Canon of  Relativity (Sec JD1)

3314 Canon of Uniformity (Sec JD2)

3315 Canon of Hierarchy (Sec JE1)

3316 Canon of Non-Hierarchy (Sec JE2)

3317 Canon of Mixed Base (Sec JF1)

3318 Canon of Pure Base (Sec JF2)

33191 Canon of Faceted Notation (Sec JG2)

33193 Canon of Co-extensiveness (Sec JH1)

33194 Canon of Non Co-extensiveness (Sec JH2)

332 Canons for Mnemonics (Part K)

3321 Canon of General Mnemonics (Chap KA)

3322 Canon of Alphabetical Mnemonics (Chap KB)

3323 Canon of Scheduled Mnemonics (Chap KC)

3324 Canon of Systematic Mnemonics (Chap KD)

3325 Canon of Seminal Mnemonics (Chap KE)

333 Canons for Growing Universe (Part L)

3331 Canon of Extrapolation in Array (Chap LC)

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3333 Canon of Extrapolation in Chain (Chap LF)

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34 Canons for Book Classification (Parts U/V)

341 Canon of Book Number (Sec UB2)

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4. Postulates of Classification (Part R)

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411 Postulate of Fundamental Categories (Sec RB1)

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416 Postulate of Rounds for Space and Time (Sec RH3)

417 Postulate of Level (Sec RJ1)

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422 Postulate of Concreteness (Sec RK2)

423 Postulate of Facet Sequence within a Round (Sec RK3)

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5   POSTULATES FOR SUB-FACETS

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511 Postulate of Main Sub-facet in a Basic Facet

512 Postulate of Primary, Non-Main Sub facet in a Basic Facet

513 Postulate of Sub-facets , other than the Main and Primary ones, in a Basic Facet.

52   Postulates for Sub-Facets in an Isolate Facet

521 Postulate of Primary Sub-Facet in an Isolate Facet

522 Postulate of Qualifier Sub-Facets in an Isolate Facet

6   PRINCIPLES FOR FACET SEQUENCE AND SUB-FACET  SEQUENCE
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    61 Wall-Picture Principle (Sec RM1)

    62 Whole-Organ Principle (Sec RN1)

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7   PRINCIPLES FOR HELPFUL SEQUENCE

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72  Principle of Spatial Contiguity (Chap FD)

        721 Principle of Bottom-Upwards (Sec FD21)

        722 Principle of Top-Downwards (Sec FD22)

        723 Principle of Left and Right (Sec FD31)

        724 Principle of Right and Left (Sec FD32)

        725 Principle of Clockwise Direction (Sec FD41)

        726 Principle of Counter-Clockwise Direction (Sec FD42)

        727 Principle of Periphery to Centre (Sec FD51)

        728 Principle of Centre to Periphery (Sec FD 52)

        7291 Principle of Away-from-Position (Sec FD6)


73  Principle of Quantity (Chap FE)

731 Principle of Increasing Quantity (Sec FE1)

732 Principle of Deceasing Quantity (Sec FE2)

74  Principle of Increasing Complexity (Chap FE1)

75  Principle of Canonical Sequence (Chap FC)

76  Principle of Literary Warrant (Chap FH1)

78  Principle of Alphabetical Sequence (Chap FJ1)