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Cataloguing Research in India.
(Cataloguing problems. 9).

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[Research in cataloguing may be said to have begun in the last quarter of the eighteenth century. Prior to 1928, the chief contributors were Baber, Panizzi, Jewett, Crestadoro, Dziatzko, Cutter, Linderfelt, and Kaiser. Their work was largely empirical. Research in cataloguing took a new turn in 1928 with the formulation of the Five Laws of Library Science by S R Ranganathan, and a still more positive turn in 1938, with his formulation of Normative Principles special to cataloguing. Work up to 1950 was done by him single-handed. From 1951, active developmental research was made possible by the formation of the Library Research Circle in Delhi. As Chairman of the Documentation Sectional Committee of the Indian Standards Institution Ranganathan promoted standards for Alphabetisation, Cataloguing Terminology, Lay-out of Catalogue Code, and Supplement to Author Statement to be printed on the back of the title-page of a book. Since 1953, at the international level he has been suggesting the formulation of simplified cataloguing rules for the books of the future, based on the standard for the Supplement to Author Statement. In his own catalogue code he provided rigorous rules for Classified Catalogue, Dictionary Catalogue, and rules for National Bibliography, Indexing and Abstracting Periodical, Union Catalogue and for cataloguing of Periodical Publications. Cataloguing research in India has been brought to the level of *a priori* research and thus Cataloguing has now become a science-based art].

ABBREVIATIONS USED
ALA Code = Cataloguing rules: author and title entries; compiled by the committees of the Library Association (London)

and the American Library Association. [Its three editions are distinguished by adding after the abbreviation their respective years of publication — for example, ALA Code (1908); ALA Code (1949); and ALA Code (1967)].

CCC = Classified catalogue code; by S R Ranganathan. [Its five editions are distinguished by adding after the abbreviation their respective years of publication — for example, CCC (1934); CCC (1945); CCC (1951); CCC (1958); and CCC (1964)].

DCC = Dictionary catalogue code; by S R Ranganathan; 1945.

Doc Sec Com = Documentation Sectional Committee of the Indian Standards Institution, Chaired by Dr S R Ranganathan.

Heading and Canons = Heading and canons: comparative study of five catalogue codes; by S R Ranganathan; 1955.

Theory = Theory of library catalogue; by S R Ranganathan, 1938.

A Terminology

Tracing the trend of research calls for distinguishing the nature of research done at various stages. This need makes it essential to adopt a precise terminology pertaining to "Research" and its "kinds". For the purpose of this paper, S R Ranganathan's ideas on "Research" and its "kinds" have been adopted (104). To ensure success in communication, Ranganathan's ideas on the subject are partially reproduced below:

A1 Research is critical and exhaustive investigation to
1 Discover new facts;
2 Interpret them in the light of known ideas — laws and theories;
3 Revise the current laws and theories when warranted by new facts; and
4 Apply the conclusions to some practical purpose.

A2 Observational Research is research through observation, with or without experiment, and survey. This is done by perception with the primary senses by themselves or aided by instruments.

A3 Empirical Research generalises the results of observation into empirical laws with the aid of inductive logic, and statistical calculus — particularly normal equations and correlation. This is done by intellect.

A4 Pragmatic Research is the generic term to denote both Observational and Empirical Research.

A5 *A priori* Research derives deduced laws from fundamental aws and/or derive therefrom or from empirical laws less general laws even to the point of concrete facts. It uses deductive logic and general semantics. This is done by intellect.

A6 Pure Research is *a priori* research pursued without a particular utility in view.

A7 Applied Research is *a priori* research pursued with some utility in view or as an aid to the development of some subject.

A8 Developmental Research makes finer adjustments and improvements in the results, already obtained by either pragmatic or *a priori* research, to facilitate the achievement of immediate utility.

B Background

As a background to the description of the trend of cataloguing research in India, a brief account is given of the work done in the field earlier in other countries.

B1 ANCIENT AND MEDIEVAL PERIOD

According to Dorothy M Norris, the catalogues, forming source of information about the cataloguing practice prevailing up to 1700 AD, fall into the following three groups:—

1 Ancient catalogues of the period ending with 1100 AD;

2 Medieval monastic catalogues of the period between 1100 AD and 1400 AD; and

3 Collegiate catalogues of the period between 1400 AD and 1700 AD (88).

Our idea of cataloguing practices, prevailing in the ancient and medieval periods, is mostly based on conjectural evidences. Cataloguing, as we conceive it to-day, is a completely modern development (202). Therefore, no attempt is made here to search for the trend of research in cataloguing prior to the modern period.

B2 BIBLIOGRAPHY AND TRADE CATALOGUE

At the beginning of the modern period, the development of cataloguing was influenced by the bibliographies and trade catalogues of those days.

B21 *Sixteenth Century*

The alphabetical arrangement of entries first occurred in the bibliographies of the early sixteenth century. The chief of them were

1 GESNER (Conrad). *Bibliotheca universalis*. 1545;

2 DONI (Antonio Francesco). *La liburiah*. 1550: and

3 CROIX du MAINE (Francois Grude de la). *Premier volume de la bibliotheque*. 1584.

In all the above documents, entries were arranged alphabetically by the personal names of the authors. However, an index of surnames was added at the end. Andrew Maunsell

introduced, for the first time, the preparation of an entry under the surname of the author, in his trade catalogue *Catalogue of English printed books* (1595). (168).

B22 *Seventeenth Century*
    Of the many bibliographies printed in the seventeenth century, the impact of the following three on the development of cataloguing cannot be denied:
    1 LINDEN (Joannes Antonides van der) *De scriptis medicis.* 1637;
    2 LIPENIUS (Martinus). *Bibliotheca realis universalis omnium materiarum, rerum et titulorum, in theologia, jurisprudentia, medicina, et philosophia.* 1679 to 1685; and
    3 BEUGHEM (Cornelius a'). *Incunabula typographiae.* 1688. The authors of the above-mentioned bibliographies were faced with the problems of
    1 Determination of authorship;
    2 Variant forms of author's name;
    3 Subject indexing; and
    4 Items of all the information needed to identify a particular document.
They solved the problems in a way which bibliographers have been using ever since. For example,
    1 Preparation of the main entry of a book under the name of its author;
    2 Preparation of cross-reference index entries for variant forms of names of authors;
    3 Preparation of specific subject entries;
    4 Preparation of *See* Reference Entries from synonyms of terms used as subject headings; and
    5 Giving Imprint in the sequence — name of the place of publication, name of the publisher, and the year of publication (10).

B3 CONTRIBUTION OF UK
B31 *Beginning of Modern Period*
    In 1787, the British Museum published, for the first time, its catalogue in two volumes under the title, *Librorum impressorum qui in Museo Britannico adservantur catalogus.* It was compiled by P M Maty, S Harper and S Ayseough. The theory governing the compilation of this catalogue is not explicitly recorded. But, it is not difficult to imagine that the cataloguing ideas implied in this compilation evolved out of some observational research and empirical research.
    The work of keeping this catalogue up-to-date continued. A new edition appeared in seven volumes between 1813 and 1819.

The improvements in the idea plane implied in this new edition was evidently the result of some developmental research. This catalogue should have formed a basis for later research in cataloguing. We may therefore take the last quarter of the eighteenth century as the beginning of the modern period of cataloguing.

B32 *Baber's Rules*
     The trustees of the British Museum decided to have one complete alphabetical catalogue of the whole collection. In April, 1834, they requested Henry Baber, the then keeper of Printed Books, to put up a proposal for the same. He suggested Antonio Genesio Mario Panizzi as the proper person to be entrusted with its preparation. He himself formulated his "Sixteen Rules" to guide the cataloguing work for the new catalogue (30). Panizzi also took part in the formulation of these rules. But, some of the finalised rules were not agreeable to him.
     If Baber's Rules are analysed and the results are arranged systematically, it appears that they embodied specific prescription regarding the
     1 Source of information for the Main Entry;
     2 Elements to be included in the Main Entry, and their sequence;
     3 Choice of Heading of the Main Entry for
          31 A book mentioning the name of its author;
          32 A pseudonymous book;
          33 A dependent book, *eg*, a translation, a commentary etc;
          34 An anonymous book; and
          35 A composite book;
     4 Rendering of each element in the Main Entry, such as Heading, Title etc;
     5 Addition of an individualising element to the Heading to resolve homonym, if any;
     6 Addition of Compulsory Notes to the Main Entry;
     7 Style of writing each element in the Main Entry;
     8 Arrangement of entries; and
     9 Specification of the slips to be used for writing the Main Entry.
     This body of rules may be regarded as one of the earliest catalogue codes. The nature of the research that led to this development had been entirely pragmatic. And in this, besides the personal experience of Baber himself, the printed catalogue of 1787 must had served as a basis. In this sense, it was also a developmental research.

B33 *Panizzi's Rules*
     Research in cataloguing reached a higher level in Panizzi's hands. Panizzi's Rules of 1839 (90) are said to be the first thorough

code drafted till then. These rules are formulated on the basis
of some empirical facts of experience about the library catalogue
as a system for document-finding. To understand the significance
of Panizzi's contribution, it is necessary to take note of these
empirical facts of experience. In the absence of any systematic
record of all of them, a few are culled below, from his evidence
incorporated in the *Report of the Commissioners appointed to
enquire into the constitution and government of the British Museum*
(1850). They are in his own words.

1 **Objectives of Library Catalogue.**— A Catalogue of a
library is intended principally to give an accurate inventory of
the books which it comprises; and is in general consulted either
to ascertain whether a particular book is in the collection, or to
find what works it contains on a given subject.

2 **Objectives of the British Museum Catalogue.**— In an
institution like this (British Museum) we ought to have the means
not only of finding the works we want, when knowing the names
of the authors, but we ought to have the means of learning who
wrote upon certain subjects, in order to be able to search among
them for the information which may be required upon those
subjects; therefore, so far, it is certainly an incomplete thing in
a great library to have only an alphabetical catalogue [without
an index of matters].

3 **Views about Classified Catalogue.**— To obtain these ends
(objectives of a library catalogue), classed catalogues have been
compiled, in which the works are systematically arranged according
to their subjects. Many distinguished individuals in different
countries have drawn up catalogues of this description, but no
two of them have agreed on the same plan of classification; and
even those, who have confessedly followed the system of another
person, have fancied it necessary to depart in some particulars
from their model. It is a remarkable thing, that all those who
have suggested to the commissioners either Dryander, or Agassiz,
or Engelmann, as patterns, have said that there should be some
modifications of their plans. The diversity of opinion respecting
the ramification of the various branches of human knowledge
renders it extremely difficult, if not impossible, to devise an un-
objectionable classification, and still more to apply it. Persons
who wish to consult a classed catalogue are unable to do so before
becoming thoroughly acquainted with the arrangement adopted
by the compiler; but even then they are not sure of applying the
system as he did: they may, therefore, search for a work in a
class or section widely different from that under which it is entered.
A synopsis of the catalogue, which may assist the enquirer in
forming an idea of the plan of classification, is of no use in finding
how it was applied in every individual instance. Any one who

has had occasion to consult a classed catalogue will own that he has seldom been able to make use of it without having recourse to the index of names of authors generally added to such compilations.

Note.-- During Panizzi's time the term classed catalogue meant a catalogue in two parts; one part having each of the entries made under a subject heading (in words) and arranged in a systematic way according to a predetermined plan of a scheme of classes; and the other part having each of the entries made under the name of an author and arranged alphabetically according to the alphabetical make-up of the name.

4 **Approach of Majority of Readers.**— It cannot be denied, that for the most part the student knows the name of the author of the book which he wishes to pursue.

5 **Kind of Catalogue Wanted.**— An alphabetical catalogue of writers is more generally useful; and as it leaves nothing to discretion, there can never be any doubt as to the place where a work is to be entered or sought for in a catalogue of this kind. The important thing now is to have a full and accurate, and complete catalogue of what we have. Those who want either to consult a book, of which they only know the subject, or to find what books on a particular subject are in the library, can obtain this information (as far as it can be collected from a little page, which is all that can be expected in a catalogue) more easily from an *index of matters* to an alphabetical catalogue than by any other means. Here also nothing is left to discretion as far as concerned order. The plan which is proposed was adopted by Dr Watt in his *Bibliotheca Britannica,* the usefulness of which work must be acknowledged by every one conversant with bibliography. With an index of subjects and the cross-references, the thing would be as complete as possible. Then there is something said about Barbier and Audiffredi being foreign authorities, and that English common-sense rebels at their principle. Being a foreign system, or an English system, has nothing to do with it; there is no English System. If there was one acknowledged I should be happy to adopt it, but we are obliged to take a good system wherever we find it. I find no other system anywhere but that of Barbier and Audiffredi. I think that if the system be good, whether it be a foreign system or an English system, does not signify in the least.

6 **Index of Subjects.**—If you have full and accurate titles well drawn up for an alphabetical catalogue, you take all the words which indicate any of the subjects treated of in that work, and you enter them alphabetically, without any trouble, whether it is a scientific arrangement, or whether it is any other arrangement except alphabetical. For instance, if you look in the index of

matters under the word "Butterflies", you find all that has been stated about butterflies, whether in a scientific sense, or in a poetical sense, or in any other sense, in the works alphabetically catalogued, so far as the titles of the books have told you. That is my notion of an *index of matters*. Under the word "Fire" you have all that is said of fire, whether fire is considered as a technical expression in works of art and in manufacturers, or whether it is fire in the sense in which the term is used by philosophers, naturalists, and so on. That is my notation of it.

B34   *Panizzi's Research*

A portion of these facts of experience was recorded after the formulation of the 91 Rules. That does not necessarily imply that it was absent in the mind of its principal formulator. Therefore, a natural conclusion is that in the context of the empirical facts of experience about a library catalogue, as evident from the statements quoted above, Panizzi formulated his 91 Rules in collaboration with his colleagues Winter Jones, Edward Edwards and John Humffreys Parry. Panizzi himself acknowledged that he owed his ideas to persons like Watt, Barbier and Audiffredi. This implies that a good amount of research in cataloguing was done before Panizzi. But the credit for the pioneering work of generalising some empirical facts of experience regarding a catalogue and cataloguing, on the basis of the results of research done earlier, and of being guided by them in the formulation of individual rules to guide the day-to-day cataloguing work goes to Panizzi. The concept of "Corporate Authorship" was first introduced by him. His rules relating to anonymous books, pseudonymous books, books of corporate authorship, and periodical publications have always been open to objection. But many of his rules have stood the test of time quite well. These rules influenced the cataloguing practice of many libraries in the English-speaking countries. Examination of Panizzi's Rules shows that no normative principles explicitly guided their formulation. Panizzi's contribution in cataloguing is a result of Pragmatic Research consisting of both Observational Research and Empirical Research. His Observational Research included a survey of works done earlier than him. The existence of the earlier rules of Baber implies that certain amount of developmental research was also involved in Panizzi's work.

B35   *Crestadoro's Rules*

As a reader in the British Museum, Andrea Cretadoro was aware of the controversy over Panizzi's Rules. In 1850, the Libraries Act was adopted in Great Britain. Crestadoro realised the need for a popular code to guide the cataloguing work

of the public libraries to be established under the Act. His code was published in 1856 (19). The kind of catalogue, that he had in his mind to formulate the rules of his code, was a bipartite one. The main part was to consist of full "principal entries" made under the names of authors and arranged serially by accession numbers. The supplementary part was to consist of short index entries derived from the "principal entries" under the names of authors and subjects. The index number of an index entry was to consist of the accession number of its "principal entry". Choice of subject headings was to be governed by the names of subjects as mentioned on the title page. As the librarian of the Manchester Public Libraries, he applied his rules to the catalogue of that library system. In designing his catalogue code, Crestadoro's object was to improve upon the existing codes by his own developmental research. Surely, his research diverted him into a wrong path.

B4   CONTRIBUTION OF U S A
B41   Jewett's Rules

According to Julia Pettee (95), Charles C Jewett, the Librarian of the Smithsonean Institution, was the author of the first American Code. It was published in 1852 (51). His work was based on his experience in compiling the catalogue of the Brown University. As the librarian of the university, he compiled an author catalogue supplemented by an alphabetical "topical index" in 1843. On the basis of this experience Jewett carried out a developmental research on the results of research obtained by Panizzi to make improvements upon them. Therefore, it may be concluded that a good amount of observational research and empirical research, and developmental research led to the formulation of Jewett's code.

B42/47   Cutter's Rule
B42   Emphasis on Author-Title Catalogue

Up to 1870's research in cataloguing had been mostly concerned with the development of Author-Title Catalogue. The principal reason for this was that the approach by the names of authors was regarded to be the majority-approach at that time. Emphasis on author-title catalogue, of course, need not have necessarily stood in the way of the development of other forms of catalogue — that is, Dictionary Catalogue and Classified Catalogue; but, in comparison, the progress in respect of those was far less.

B43   Emphasis on Subject Cataloguing

According to Cutter, there were dictionary catalogues

in USA since 1815. A few important ones of the later decades of the nineteenth century were the catalogues of the
1   Boston Public Library (1861 and 1866);
2   Boston Mercantile Library (1869);
3   Cincinnati Public Library (1871); and
4   Library of Congress (1870's).
By the middle of 1870's, the results of observational research done by many librarians established the fact that the subject-approach could no more be regarded to be the minority approach in all libraries. This had all along been the feeling of all the designers of classified catalogue. It was realised that the practice of providing an "Index of Matters" as a supplement to an author catalogue would not prove sufficient to meet the increasing demand of subject-approach. This finding directed much attention to the question of subject-cataloguing; and it marked the beginning of the development of the idea of dictionary catalogue prevailing at that time. The library profession has been fortunate in Charles Ammi Cutter having taken up a systematic pursuit of this subject.

B44   *Cutter's Research*
        Cutter carried out an extensive pragmatic research consisting of a survey of all the earlier works of importance pertaining to cataloguing. On the basis of his survey, he concluded, "For a dictionary-catalogue as a whole, and for most of its parts, there is no manual whatever. Nor have any of the ... works attempted to set forth the rules in a systematic way or to investigate what might be called the first principles of cataloguing" (21). Therefore, he carried his research further in order to prepare a manual for a dictionary catalogue in which the formulation of each individual rule would be based on some "first principle" of cataloguing and all the rules thus obtained would be arranged in a helpful sequence. He realised quite well that such an attempt, to be really worthwhile, must be preceded by an extensive practice of cataloguing work, based on the ideas that he had in his mind. So, he took up the work of compiling the catalogue of Boston Athenaeum according to his own ideas. This catalogue was published in five volumes between 1874 and 1882.

B45   *Guiding Principles*
        His observational research, consisting of survey and experiment, led him to the empirical research of formulating a few first principles of cataloguing. These empirical principles he recorded as follows:

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1 **"Objects**
   1   To enable a person to find a book of which either
      (A) the author }
      (B) the title   } is known
      (C) the subject }
   2   To show what the library has
      (D) by a given author
      (E) on a given subject
      (F) in a given kind of literature.
   3   To assist in the choice of a book
      (G) as to its edition (bibliographically)
      (H) as to its character (literary or topical).

2 **"Means**
   1   Author entry with the necessary references (for A and D).
   2   Title entry or title-reference (for B).
   3   Subject-entry, cross-references, and classed subject-table (for C and E).
   4   Form-entry and language-entry (for F).
   5   Giving edition and imprint, with notes when necessary (for G).
   6   Notes (for H).

3 **"Reasons for Choice**
    Among the several possible methods of attaining the OBJECTS, other things being equal, choose that entry
   1   That will probably be first looked under by the class of people who use the library;
   2   That is consistent with other entries, so that one principle can cover all;
   3   That will mass entries least in places where it is difficult to so arrange them that they can be readily found, as under names of nations and cities" (22).

B46   *Rules for Dictionary Catalogue*
    On the basis of these principles, Cutter formulated the individual rules for his code — the *Rules for a dictionary catalogue* (1876) (20).
    This code distinguished the parts constituting a dictionary catalogue as follows:
   1   Author-catalogue;
   2   Title-catalogue;
   3   Subject-catalogue; and
   4   Form-catalogue.
It prescribed rules for the Choice, Rendering, and Recording (*style*) of each section of each kind of entry constituting the ultimate

unit record of each part of a dictionary catalogue. The rules for the arrangement of entries formed a section of the part on style. Regarding the need of technical terminology he said, "There is such confusion in the use of terms in the various prefaces to catalogue — a confusion that at once springs from and leads to confusion of thought and practice — that it is worthwhile to propose a systematic nomenclature". Therefore, he devoted a part of his code to cataloguing terminology under the heading "Definitions".

Cutter was the pioneer to recognise the social pressure on the library catalogue to provide subject entries — specific subject entries, *see also* subject entries, and *see* subject entries — the last to the minimum necessary extent. He framed his fifteen rules (Rules 161 to 174) for the choice, rendering and recording of subject entries. These rules still hold sway.

B47 *Appreciation of Cutter's Contribution*

Appreciating the pioneering contribution of Cutter, S R Ranganathan said, "None of the [earlier] drafts set forth cataloguing rules in a systematic or exhaustive way. Nor was there much evidence of their roots stemming from some kind of first principles. Nor again was any of them a general code not particularly conditioned by the practice of a single library. RDC was the first code to reach beyond these limitations. Its limitation was only in the linguistic context. The library profession has been fortunate in the author of this code. He was a genius. This is seen in the ring of certitude and the profoundness of penetration found in the rules and the commentaries of RDC. They are like the eternal epigrams of a sage. RDC is indeed a classic. It is immortal. Its influence has been overpowering. It inhibits free re-thinking even today. It appears to have been the chief source of later codes in the English language. Being a one man's creation, it has been largely apprehended intuitively. It has been later chiselled to a slight degree. That is why, RDC is whole as an egg" (139).

For the reasons mentioned above, 1876 may be regarded as an eminent epoch in the history of research in cataloguing science. A good amount of developmental research brought out its three more editions in 1889, 1891, and 1904 respectively.

B48 *Linderfelt's Rules*

K A Linderfelt carried out a developmental research on Dziatzko's *Instructions* described in Sec RB 51. His research consisted of a comparative study of the *Instructions*, Panizzi, Cutter, Dewey, Perkins, and other authorities. The results of his research was published in 1890 under the title *Eclectic card*

catalogue rules (64).

B5   GERMAN CONTRIBUTION
B51   *Dziatzko's Rules*
        In the middle of the 19th century, the Munich code of
about 1850 was the only influential code in Tutonic countries.
In Germany, Karl Dziatzko's developmental research on the
Munich code resulted in a code by 1874 (27). This became popu-
larly known as Dziatzko's *Instructions*. It was   published in
1886. Its distinctive features are said to have mainly centred
round its prescription relating to anonymous books and books
of corporate authorship.

   52   *Prussian Instructions*
        In 1890, Royal Library of Berlin brought out changes in
some of the prescriptions of Dziatzko's *Instructions* and adopted
the code thus modified. It was further expanded in 1892. In
1896, the Prussian Government made a budget provision for a
union catalogue. The catalogue of the Royal Library of Berlin
was adopted as the basis of this union catalogue. A committee
was appointed to simplify the code of the Royal Library in respect
of bibliographical details. The result was the Prussian Instruc-
tion (1899) (48). No normative principles appeared to have
guided this committee product. Still it bears in certain places
the impress of Germanic freeness and thoroughness.

B6   OTHER CODES OF THE 19TH CENTURY
        In cataloguing, the trend of pragmatic research went on
continuously along with certain amount of developmental research.
The result of all this, in most cases, got embodied in a few cata-
logue codes. The important ones are mentioned below:
        1 BRADSHAW (Henry). Rules to be observed in forming
the alphabetical catalogue of printed books. [Designed before
1878 for the library of the University of Cambridge].
        2 LIBRARY ASSOCIATION (Great Britain). Cataloguing rules.
[Designed before 1882].
        3 NICHOLSON (E W B). Rules for the general catalogue of
printed books. [Designed in 1882 on the basis of the rules of
the Library Association for the Bodleian Library at Oxford].
        4 AMERICAN LIBRARY ASSOCIATION. Condensed rules for
an author and title catalogue. 1883. [Revised in 1886].
        5 PERKINS (F B). San Francisco cataloguing for public
libraries. 1884.
        6 DEWEY (Melvil). Rules for author and classed catalogue
as used in Columbia College Library. 1888.
        7 DEWEY (Melvil). Library school card catalogue rules.

with 52 fascimiles of sample cards for author and classed catalogues. 1889.

B7 ANGLO-AMERICAN CODE

At the beginning of the twentieth century, research in cataloguing was taken up mostly by the library associations of UK and of USA. Each of these associations had their own cataloguing rules formulated through corporate endeavour during the end of the nineteenth century (*See* Sec B6 of this paper). At the beginning of the twentieth century, both the associations engaged themselves in revising their respective codes. At this stage, Melvil Dewey suggested that UK and USA might unite to establish a uniform catalogue code for use in English-speaking countries. The Library Association of the two countries, ultimately, agreed to co-operate in the production of a joint code. This may be regarded as an agreement for team research in the field of cataloguing. The results of this team research ultimately got embodied in the form of the Joint Code (62).

This code was a record of British and American agreement as well as disagreement over the adoption of the contributions of Panizzi, Dziatzko, Cutter, and Linderfelt. This code was highly influenced by the Library of Congress rules of cataloguing (1905). The new feature of this code centred round an attempt to distinguish between society and association on the one hand and institution as limited to permanent establishments with buildings and equipment on the other. This new feature had always been open to criticism. In the context of the tradition established by Cutter in his *Rules*, this code could hardly claim any superior feature though compiled later. Its importance lay only in the fact of its being widely adopted in UK and USA, with differing rules wherever agreement could not be reached.

B8 RESEARCH ON SUBJECT HEADINGS
B81 *Subject Authority List*

After the Joint Code, research in cataloguing was mostly concerned with Subject Headings. Cutter's guiding principles were not adequate to meet all the situations. But in practice, cataloguers had to deal with issues which Cutter could not cover. Therefore, some kind of development took place; and this development was almost exclusively confined to USA. This phase of development is characterised by the compilation of a list of Subject Headings (63) by the Library of Congress. The derivation of subject headings in the Library of Congress List did not present any standard pattern of practice, specially in the areas not covered by Cutter. On the other hand, they appeared to have embodied a large number of arbitrary decisions.

B82 *Kaiser's Theory of Subject Heading*

J Kaiser's approach to the problem of Subject Heading (55) makes one feel that he was well in advance of his time. His theory may be well described as a postulational one. The essentials of his ideas may be presented in the form of a few postulates as follows:

1 A compound subject consists of components each of which is either a "Concrete" or a "Process".

2 The term 'Concrete' denotes either a thing, or a place, or an abstract idea not signifying an action or a process.

3 The term 'Process' denotes either

    1 a mode of treatment of the subject by the author, or

    2 an action or process described in the document, or

    3 an adjective related to the "Concrete" as complement to subject.

His important instructions for the construction of subject heading may be presented in the form of a few Rules as follows:

1 A term denoting a "Process" may imply an object or material which is "Concrete". When such a term is associated with a particular object, avoid such analysis. In doing so, one "Concrete" gets concealed in a word denoting the "Process"

2 A "Concrete" may have to be denoted by a multi-worded term. Such a term is to be cited as it stands without inversion.

3 The term denoting the "Concrete" of a compound is the Entry Word/Entry Element in all cases.

4 Where two "Concretes" are involved, and one cannot be concealed in a term denoting the "Process", make double entry using each "Concrete" in association with the same "Process" term.

5 Make double entry for locality-topic combinations. The structure of the two entries should be as follows:

    1 CONCRETE, Place, Process, and

    2 PLACE, Concrete, Process.

6 Cite a term denoting local unit within a country, as the subheading of the term denoting the country.

7 Make double entry when a relation between terms denoting two countries cannot be expressed with the help of a term denoting a "Process".

8 Do not make any cross-reference from a term denoting a "Process".

9 Link up by cross-references every term denoting a "Concrete" with the hierarchical superiors and inferiors.

10 Each of the second and subsequent words or phrases used as a component of a multiworded term denoting a "Concrete", is to be cross-referred.

It may be noted that the distinctive mental process involved

3

in the formulation of these postulates and rules was "Induction". It was, indeed, a higher order of empirical research.

C Fundamental Laws of Library Science
C1 FIRST FORMULATION

The development of library science prior to 1928 had been only on empirical basis. This was due to the fact that no fundamental laws of library science could be seized during that period. Therefore, research in the different branches of library science was mostly confined to pragmatic research. The developmental researches, that were carried out during this period, took over from the results of such pragmatic research only. Cataloguing was no exception to it. From this point of view, 1928 is an epoch in the history of the development of library science as a whole. It was the year of the formulation of the Five Laws of Library Science by S R Ranganathan. The treatise on these Laws was published first in 1931 (135).

C2 FIVE LAWS OF LIBRARY SCIENCE

The Five Laws of Library Science have been enunciated as follows:

1 Books are for use;
2 Every reader his book;
3 Every book its reader;
4 Save the time of the reader; and
5 Library is a growing organism.

Note:—In these Laws the term 'Book' has been generalised by the author of the Laws into the term 'Document' (171). These are the normative principles of Library Science. They furnish an interpretive explanation of the empirical facts of experience and of the techniques found necessary in experience.

C3 TRANS-INTELLECTUAL APPREHENSION

Research is essentially intellectual. In the formulation of empirical principles by induction it is essentially the intellect that is brought into play. But, it is intuition alone that can flood-light the phenomenal world down to the near-seminal level and reveal fundamental laws. They are apprehended without the mediation of intellect or perception; and such an apprehension is referred to as "trans-intellectual". Trans-intellectual apprehension of fundamental laws through intuition is not taken to be research; it is beyond research. It is the ultimate starting point for *a priori* research. The Five Laws of Library Science enunciated by Ranganathan are not a product of research through intellect, but of trans-intellectual apprehension.

C4 IMPACT OF FIVE LAWS

The Five Laws of Library Science provided the basis for *a priori* research in the different branches of Library Science. For this reason, 1928 is to be regarded as a turning point in the history of research in Library Science as a whole, and in each of its branches. Thus, India had the benefit of starting *a priori* research in library science even from the beginning. Naturally, the research, leading to the development of cataloguing in India, has always been a blending of pragmatic research consisting of observational research and empirical research, and of *a priori* research.

C5 FIRST *A Priori* RESEARCH

A priori research in cataloguing was first carried out by S R Ranganathan himself. It turned on the determination of the implications, in detail, of the Five Laws on Cataloguing. They were enumerated in his *Five Laws* itself (135). The distinctive mental process involved in this research was " Deduction". It was essentially the intellect that was brought into play in this work. This was pursued for immediate distinct utility of designing an efficient system of document finding. In this sense, the level of Ranganathan's *a priori* research was that of an applied research.

D Classified Catalogue Code

D1 GENESIS OF DESIRE

The desire for designing an efficient system of document finding, and for that purpose, the desire for designing a catalogue code on scientific lines originated in the mind of S R Ranganathan even in 1924–25. As regards the genesis of the Classified Catalogue Code, Ranganathan has stated as follows: "The Classified Catalogue Code owes itself to the sense of revolt induced in the mind while learning cataloguing in 1924–25, in the School of Librarianship of the University College of London. The first cause of revolt was the method of teaching used. Each rule of the Anglo-American Code was taken by itself, to be put into rote-memory as it were. No attempt to present the rules as a system. No attempt at studying an alternative code and comparing their relative merits. But this is necessary to sense the theory behind the practice. The second cause was the nature of the Code taught. It was the Anglo-American Code of 1908. Its skeleton nature, its mixing up the author entry and the subject entry, lack of unity in many of its rules — a serious drawback in the drafting of a code — all these added to the result. There was also a third cause. The volumes of the Classified Catalogue of the Carnegie Library of Pittsburgh and of the Mitchel Library of Glasgow were fascinating. Copies of these were available in the library

of the School of Librarianship. But not a word was said in the class either about Classified Catalogue or about the essential difference between it and Dictionary Catalogue. A fourth cause came out of the discrepancy between the rules taught in the theory class and those prescribed for adoption in the practical class. Here again, nothing was said or done to satisfy the curiosity of students about this difference. Fifthly, the bibliographical details about format, collation and imprint were overemphasised in the practical class. The revolt made one say within oneself "When I go back home" (121).

D2 FOUNDATION

D21 *Deduction of the Functions of a Catalogue*

On coming back to Madras, facility of every kind was found to re-think cataloguing work. The full responsibility of reorganising the Madras University Library was entrusted with Ranganathan; and he was given full freedom to do his best. While applying his mind fully to this purpose, he intuitively seized the Five Laws of Library Science. He worked out the full implications of the Five Laws on document finding system. On the basis of this, he summarised the essential functional attributes of a library catalogue as follows:

"A library catalogue should be so designed as

1 To disclose to every reader his or her book;

2 To secure for every book its reader;

3 To save the time of the reader; and

4 For this purpose, to save the time of the staff" (113).

5. A catalogue is ever growing in complexity

D22 *Deduction of the Internal Form of a Catalogue*

By that time, it was fully realised that the majority—approach to a library catalogue was the subject-approach and not the author-approach.

Ranganathan deduced the internal form of the catalogue that would be most suitable to satisfy the Five Laws of Library Science in the context of the majority-approach by the name of subjects. He recorded his findings as follows:

"The catalogue is to consist of two parts, *viz*, the Main Part and the Index Part.

The Main Part is to serve as a Classified Subject Catalogue.

The Index Part is to serve as an Alphabetic Catalogue and as an Index to Classes of Subjects" (114).

At this stage, he made an extensive survey of the documents pertaining to cataloguing in order to take note of the developments already achieved in this direction. On the basis of this survey he concluded,

"The author catalogue, the dictionary catalogue and the

Classified Catalogue represent three successive stages in the order of evolution of the internal form of the catalogue. The Classified form being the latest to evolve, the literature relating to it is comparatively scanty. It is strikingly so in the case of the systematic code of rules for cataloguing. While the number of codes for the author catalogue is fairly large and the number for the dictionary catalogue is also respectable, there appear to be few systematic and complete codes published in book form, for the classified catalogue" (112).

D23 Deduction of the Physical Form of a Catalogue

Ranganathan further deduced the physical form of the catalogue that would be most suitable to satisfy the Five Laws. He recorded his findings as follows:

"The choice of form has to be made in the light of the Fifth Law of Library Science. The main concern of the Fifth Law is to give full weight to the ... factor ... viz, the need for casual repairs and frequent addition of details even while the catalogue continues to be in use. The days of time-honoured bound book form are gone for ever — never to return — at least in the case of a growing vital library. The loose-leaf form and the card form are so much alike, that they admit of nearly the same style of making the entries ... the card form marks a later stage of evolution, ... it is rightly more popular ..." (115).

D24 Survey of Readers' Approach

Immediately after he took charge of the Madras University Library, Ranganathan started his pragmatic research consisting of experiments with different Library techniques, such as classification, cataloguing etc and of observation of the classificatory and cataloguing approach of readers to books. The approach of the readers in his library had not been coloured at all by any tradition, as most of them tested library facility — and open access in particular — for the first time in their lives. This gave as good an approximation as possible to unconventionalised, free, natural mental behaviour on the part of readers (122).

D25 Need of a New Scheme for Classification

On the basis of this pragmatic research, Ranganathan developed his idea regarding the nature of the subject-approach of readers. He observed that few readers were able to name their specific subjects exactly. He noted that it was a broader or a narrower subject that is usually brought about. He concluded that if it was interest in a subject which took a reader to the library, his wants would be better served if the catalogue could spread before him a full, connected panorama of all the materials on

his specific subject, all its subdivisions and all broader subjects of which it was itself a subdivision. In the context of complete reorganisation of the library, the above implication called, as a prerequisite, a scheme for classification which could

1 Individualise specific subjects of any degree of intension whatever;

2 Arrange specific subjects at all levels in an acceptable filiatory sequence; and

3 Individualise the different books in a specific subject.

There was no such scheme available at that time. Therefore, Ranganathan himself took over the responsibility of designing such a scheme for classification. A dash of intuition in him brought out the *Colon classification* (= CC) (131). The development of the science of classification went several steps forward due to the original contributions of CC. It introduced the revolutionary idea of Faceted Scheme for Classification in the field of Library Science.

D26 *Practice Preceding Theory*

With a scheme like Colon Classification in hand, it became easier for him to give shape to the Classified Catalogue mentally conceived by him. He started his experiment and practice — an intensive research consisting of a blending of *a priori* research and pragmatic research. In his practice work, C Sundaram and K M Sivaraman assisted him with all-participating attitude (123). The magnitude of this practice work becomes evident from the data that about 70,000 volumes were classified, catalogued and served during the 7 years, from 1926 to 1932 (124). Another opportunity of evaluating his ideas and work was his experience of teaching cataloguing in the School of Library Science established in 1929.

D27 *First Formulation of CCC*

In this way, eight years of *a priori* and pragmatic research brought the Classified Catalogue Code (= CCC) to the conscious level. It is interesting to note the environment in which it was written. It was in September 1933. Ranganathan was to go to Calcutta to attend the Annual Meeting of the Imperial Library Committee and, incidentally attend also the first All-India Library Conference. It was a railway journey of 38 hours. During the 20 hours of daylight in the forward journey, and equal extent of time in the return journey, and during his stay in Calcutta including the hours of the Conference he wrote down the rules of CCC. On return to Madras, these were reviewed along with his colleagues. These were checked up and polished. Examples were provided. The press-copy was typed (125).

D28   *Contribution of CCC*

CCC (1934) is the first complete, comprehensive code of rules for the classified catalogue. Its original and developmental contributions may be noted as follows:

1 It deduced the essential functional attributes of a library catalogue by summarising the implications of the Five Laws of Library Science on cataloguing.

2 It deduced the most suitable internal form of catalogue that would satisfy the Five Laws.

3 It deduced the most suitable physical form of catalogue that would satisfy the Five Laws.

4 It developed the technical terminology of cataloguing to a great extent.

5 It distinguished each and every type of entry that would occur in a classified catalogue.

6 It systematised and added to the principles of alphabetisation.

7 It grouped the major problems in cataloguing in a new and helpful way as follows:—

   1 Single volumed simple book;
   2 Composite book;
   3 Multivolumed book; and
   4 Periodical publications.

8 In formulating the individual rules, it took note of the unit operations involved in cataloguing work — *viz*, choice, rendering, and recording; and in drafting them, it followed the *Sutra* (epigram) style as much as English language allowed it. This invested the rules with resiliance. This style further helped it to implement the Principle of Unity of Idea, in drafting each rule.

9 While the drafting of the earlier codes had been severally empirical as based on tradition, CCC had the benefit of being guided by the normative principles which had been enunciated as the Five Laws of Library Science.

10 It dealt with the structure and rendering of Hindu and Muslim names more elaborately than any of the earlier codes.

11 It recognised for the first time that the work of determining the subject heading should be based on a scheme for classification; and it furnished a definite procedure to derive it from class number. The procedure with certain modifications was, later on, denoted by the term 'Chain Procedure'. This was a revolutionising novel idea.

12 Its dealing with periodical publications was a sound novel feature. It resulted from a very thorough and extensive research — both *a priori* and pragmatic. On the basis of an extensive pragmatic research, it distinguished eighteen elemental types of complexities, falling into six groups, in relation to the

cataloguing problems of periodical publications. On the basis
of an experiment, it concluded that these complexities could be
dealt with more economically by a classified catalogue than by a
dictionary catalogue. It included an elaborate system of rules
to construct a classified catalogue for periodical publications.

13 It furnished an ideal example of the lay-out of a cata-
logue code, far more developed than in any other earlier code.

14 It indicated the different areas in cataloguing calling
for immediate further research.

E **Theory of Library Catalogue**
E1 BACKGROUND

After CCC was ready for the press, S R Ranganathan
engaged himself in recording the results of his research in library
management. The *Library administration* (1935) was the result.
Next, he engaged himself in examining the theoretical foundations
of library classification. The *Prolegomena to library classification*
(1937) was the result. Being equipped with the experience gained
in these two areas of library science, Ranganathan engaged him-
self in an attempt to examine the theoretical foundations of
cataloguing practice. CCC (1934) served as the basis for this
research.

E2 GENESIS OF *Theory*

Between 1934 and 1937, some of the rules of CCC came up
for critical examination by the author with his students and
colleagues, from time to time, both in class-room discussion and
in staff meeting to consider problem books in cataloguing. The
technical terminology developed by CCC proved very helpful
in these discussions. On the anvil of such critical discussions,
certain normative principles of cataloguing took shape. Though
they were implications of the Five Laws, they formed a distinct
set of normative principles formulated to form the foundation
of cataloguing theory and practice. These special normative
principles were called Canons of Cataloguing. Ranganathan
had the privilege of continuously subjecting CCC and the other
codes to a severe semantic analysis and check up in the pure
intellectual plane — in the class-room and in staff-meetings.
This helped the formulation of the canons; and it also led to the
setting up of the scientific method in the discipline of cataloguing.
The experience of this first attempt was recorded in the *Theory
of library catalogue* (= *Theory*) (1938) (166).

While drafting the Theory, quite unexpectedly Ranganathan
received from Rudolph Gjelsness, Chairman and Editor-in-Chief
of the Catalogue Code Revision Committee of the American

Library Association, a complete set of the draft of the first revision of the ALA Code for evaluation and suggestion. The canons turned out to be of immense help in responding to the invitation of Gjelsness.

E21 *Self-Educational Effect of Teaching*

Regarding the genesis of the Theory, Ranganathan mentioned that it owed much to the classes of the School of Library Science of the University of Madras. In this connection, he mentioned about the self-educational effect of teaching as follows:

"All teaching is reciprocal, particularly if the subject taught has not yet reached the stage of deduction from principles. Rule of thumb really satisfies neither the teacher nor the taught. There can be no rest for a teacher till he arrives at a few easily remembered fundamental principles from which rules to meet any practical situation can be promptly and unerringly derived. This self-educational effect of teaching has been well emphasised by the Upanishadic seers. According to them four stages can be recognised in education:

(1) *Adhiti* (Study); (2) *Bodha* (Understanding);

(3) *Acharana* (Practice); and (4) *Pracharana* (Teaching); and one's education is not complete till the last has been lived. It is usually at this stage that principles are crystallised" (167).

E3 CONTRIBUTION OF *Theory*

The original and developmental contributions of *Theory* may be noted as follows:

1 With reference to the Five Laws of Library Science, it established the theoretical support in respect of making catalogue 'One Book Many Entries' type.

2 It enunciated for the first time the fundamental principles to be conformed to by the designer of a catalogue code. Besides the Five Laws of Library Science they were as follows:

1 Canon of Consistency;
2 Canon of Relevance;
3 Canon of Ascertainability;
4 Canon of Permanence;
5 Canon of Currency; and
6 Canon of Prepotence.

It demonstrated the effective utilization of the Law of Parsimony — one of the most elemental general principles — in cataloguing.

3 It improved upon and added to the technical terminology of cataloguing to a considerable extent.

4 The procedure prescribed for the derivation of subject heading from the Class Number of the subject was fully deve-

loped in the *Theory*, as Chain Procedure. It made out a case for the need for invoking the aid of a scheme for classification in determining the specific subject of a book. For the purpose of Chain Procedure, it gave the first draft of a code of rules. Use of the Chain Procedure for the determination of *See also* Subject Entries was also explained.

5 It established the essential similarity between the Classified Catalogue and Dictionary Catalogue on the basis of a discussion on the syndetic *vs* systematic arrangement.

6 It illustrated the application of the Fundamental Principles to specific problems of Series Entries, Analytical Entries and to a comparative study of the rules pertaining to periodical publications of different catalogue codes.

7 It studied critically the controversial rules of the Anglo-American Code (1908) in the light of the Fundamental Principles. It advocated the merging of 'Societies' and 'Institutions'. This suggestion has now been carried in the 1967 edition of this code. It showed how certain rules led to Subject Entries instead of Author Entries, quite against the avowed purpose of the Code.

8 It developed the concept of the Gestalt Value of items in an entry. This was shown to help in the linking up of the legislative and executive phases of alphabetisation and towards securing closer observance of the Canon of Consistency.

9 It furnished a comparative study of the Classified Catalogue with the Dictionary Catalogue in the light of the Fundamental Principles to show the efficiency of the former over the latter; and it explained the psychological and social factors standing against attempts to change over to the Classified form from the Dictionary form.

10 It recognised the problem of conflict of authorship centring round (1) Person *vs* Person; (2) Person *vs* Corporate Body; and (3) Corporate Body *vs* Corporate Body. It demonstrated how to resolve such conflicts by proper interpretation of the two terms 'Personal Author' and 'Corporate Author'. Further, it separated out the problem of determination of authorship from that of the choice of the Heading of the Main Entry and recommended this suggestion to be followed by other catalogue codes. Unfortunately, the *Anglo-American Cataloguing Rules* (1967) appears to have consciously developed a allergy against this suggestion.

11 It indicated further areas of research in cataloguing.

F Dictionary Catalogue Code

Comparative study is an essential basis of developmental research. For this purpose, it was necessary to compare the relative merits of a Classified Catalogue and of a Dictionary Cata-

logue, in order to effect improvement in their respective codes. The essential fundamental principles on the basis of which such a comparison was to be made were provided by *Theory*. But another essential condition that was necessary was that the two kinds of catalogues taken for comparison should be prepared for the same set of books on the basis of the codes having, more or less, equal degree of rigour and thoroughness and on the basis of one and the same scheme for classification designed to individualise the specific subjects of all degrees of intension. An evaluation of the *Rules for adictionary catalogue* of Cutter showed that it suffered from the usual handicaps of a pioneer — that is,

1 The rules were uneven in thoroughness;

2 Those for the choice, rendering and style of writing of the sections of an entry were neither organically related nor sufficiently exhaustive; and

3 Those for Subject Headings were lacking in precision as their determination was not made to depend explicitly on a scheme for classification which could individualise specific subjects of any degree of intension whatever.

It was also found that no later and more improved code had been published to take the place of the *Rules*. Therefore, it became necessary to design a dictionary catalogue code of the same rigour and standard as CCC. The results of research done in this direction got embodied as the *Dictionary catalogue code* (= DCC) (1945) (134).

G Library Catalogue : Fundamentals and Procedure

In fact, the design of DCC was preceded, like that of CCC, by an extensive pragmatic research consisting of a survey of the existing literature and of experiments and practice of cataloguing on the basis of the draft rules. This was followed by an objective comparative study of the Classified Catalogue with the Dictionary Catalogue of one and the same assortment of 306 books. The practical instruction for and demonstration of the preparation of these two kinds of catalogues along with the reflections thereon formed the *Library catalogue: fundamentals and procedure* (1950) (= Fundamentals) (152). The whole work was completed before the finalisation of the manuscript of DCC in 1944. But, due to war-condition, it could not be published earlier than 1950.

H Developmental Research Since 1950

Barring a few improvements in the Normative Principles of cataloguing the trend of research in cataloguing in India since 1950 has been mostly developmental. This developmental research has been conditioned by the advent of scientific method. In

scientific method there is a never-ending spiral:

1 From individual experiences; through generalisation, to empirical laws derived from them, with the aid of induction and normal equation;

2 Through their reduction to a few normative principles with the aid of imagination and/or intuition;

3 Through deductive laws or canons derived from the normative principles with the aid of methods of inference and semantics;

4 Through fresh individual experiences not conforming to them;

5 Back again through another cycle; and

6 So on, without end (135).

Such a cycle of development has now been established in cataloguing; and this has been set up by the *Theory* (1938). Both the teaching of cataloguing and the designing of catalogue code can now have the benefit of normative principles and scientific method. New types of reading materials, apparently transcending the capacity of the existing rules of a catalogue code, may in some cases be catalogued by proper interpretation of its rules. To meet the cases that cannot be managed in this way, the rules are to be amended or added to with the aid of the normative principles. When the cumulated unconscious shift in the social purpose of the library calls for an altogether different kinds of library service, organisation and technique, and the current ones stand abandoned by sheer folk-force, new normative principles should replace the old ones. And the cycle should be started again.

The development of cataloguing to-day is directly amenable to the spiral of scientific method. This quality of "Cataloguing", as a subject, fulfils the necessary condition of its being called a Scientific Discipline. Research in cataloguing in India is fully aware of this fact; and it has contributed considerably to the further development of the different areas in cataloguing. The succeeding sections are devoted to these developmental researches since 1950.

J Cataloguing Terms

J1 FROM 1934 TO 1952

The development and the correct practice of a discipline is largely dependent on the verbal apparatus used to express ideas and communicate them. This is so in the discipline of cataloguing too. The success of critical or comparative study of several catalogue codes is largely dependent on a special, agreed, dry-as-dust terminology without even the slightest touch of fuzziness. S R Ranganathan realised this need even from the beginning of his research in cataloguing. That is why, from the very beginning, he attempted to develop the cataloguing terminology on

the basis of the already existing ones. The results of his earliest work in this field were incorporated in his CCC (1934), and his *Theory* (1938). This has been referred to in Sec D and E. Further developments of cataloguing terminology were incorporated successively in the

    1 *Dictionary catalogue code* (1945) (*See* Sec F);

    2 *Classified catalogue code*, Ed 2. (1945) (117);

    3 *Library catalogue: fundamentals and procedure* (1950) (*See* Sec G); and

    4 *Classified catalogue code*, Ed 3. (1951) (118).

J2 RESEARCH PROJECT OF 1954

In 1954, a research project on cataloguing terms was taken up by K D Puranik under the guidance of Ranganathan. This was felt essential to take up another research project of comparative study of some authoritative carefully designed catalogue codes. Puranik compiled a complete glossary of cataloguing terms on the basis of all the authoritative works available at that time (98).

J3 FURTHER DEVELOPMENTS

The cataloguing terminology already established by the Indian School of Thought had to be further developed and improved upon to take up the research project of comparative study; and the results of this research was incorporated in *Headings and canons* (1955) (140). They were later incorporated in CCC, Ed 4. (1958).

At this stage, it was felt helpful to standardise at the national level the cataloguing terminology already established. Accordingly, the Doc Sec Com siezed the problem and after several meetings of the sub-committee, the *Glossary of cataloguing terms* was finalised. It was adopted on 3 June 1959 (42).

Certain developments and improvements of this terminology were brought out in CCC, Ed 5. (1964).

In the light of the experience gained in preparing Ed 5 of CCC, a revised version of the *Glossary* was brought out in 1966 (43).

In 1966, A Neelameghan suggested the replacement of the term " Locus Section" in CCC by the term ' Host Section', because of the conflict of the former's definition with that of the term 'Locus' (85).

In the field of cataloguing terminology, continuous research is in progress. Some developments and improvements have already been brought out. They will be incorporated in Ed 6 of CCC (172).

K   Normative Principles
K1   DEVELOPMENT
    The normative principles of cataloguing fall in four groups
as follows:
    1   General Laws;
    2   Laws of Library Science;
    3   Canons of Cataloguing; and
    4   Law of Local Variation.
    After the *Theory* they were considerably developed and
improved upon in the *Heading and canons* (1955) (141). These
principles guide every problem in "Cataloguing — that is,
    1   Drafting of a Catalogue Code including the formulation
of each rule;
    2   Interpretation of the rules to meet new situations brought
up by a particular document or by changes in the practice of book
production; and
    3   Provision of suitable guidance for cataloguing work.
As if to remind users of the Code that its rules are not *ad hoc*
ones, but are those derived from Fundamental Laws, and as if
to facilitate the basing of the interpretation of the rules on Nor-
mative Principles, CCC has incorporated the Fundamental Laws,
and the Canons of Cataloguing in its first part with the necessary
commentaries and examples. The Law of Parsimony was the
only General Law mentioned in the *Theory* (1938). The *Heading
and caonons* (1955) added the following General Laws:

    1   Law of Impartiality; and
    2   The set of Laws of Interpretation.
    Among the Canons of Cataloguing, only six were enunciated
in the *Theory* (*See* Sec E3). Two canons were formulated at a
later stage; and they were incorporated in the *Heading and canons*.
These new ones were
    1   The Canon of Context; and
    2   The Canon of Purity.
The Canon of Relevance of the *Theory* (1938) was renamed Canon
of Sought-Heading in the *Heading and canons* (1955). The
exposition of the canons was much improved in the *Heading
and canon* (1955). The Canon of Individualisation was incorpo-
rated first in CCC, Ed 4 (1958). The Canon of Purity has now
been dropped.
    In 1952, K L Kaul showed the inadequacy of the definition
of the Canon of Ascertainability and suggested a line of improve-
ment (57).
    Further, in 1963, A Neelameghan analysed the implications
of the Canon of Ascertainability in relation to a conflict centring
round the information given in the title-page and its overflow
and that given in the foreword, introduction, etc (84).

Again in 1964, M M Job demonstrated a case of conflict centring round the Canon of Ascertainability and the Law of Parsimony and concluded that the satisfactory solution to such problems was the standardisation of title-page information (52).

The current version of the normative principles of cataloguing are given in CCC Ed 5 (1964).

K2 LATEST VERSION

K21 *Potentiality*

This set of normative principles of cataloguing is one of the outstanding contributions of India in the field of Cataloguing. The potentiality and the versatility of these principles have not yet been fully realised by the library profession at large. Probably, when first enunciated, these normative principles were ahead of time. However, their helpfulness and importance will be realised in due course. Those who have experienced cataloguing as a discipline find them as the only set of normative principles available for the discipline, to-day. The following are the latest versions of those normative principles:

K22 *Canons of Cataloguing*

1 Canon of Ascertainability.— The principle prescribing that the information found in the title-page of the document catalogued and in its overflow pages should determine the choice of each section of an entry.

Note.— The contents of the principle is summarised here; and the exceptions are not mentioned.

2 Canon of Prepotence.— The principle that the potency to decide the position of an entry among the various entries in a catalogue should, if possible, be concentrated totally in the leading section; and even there, it should be concentrated as much as possible, in the entry element; and further if total concentration in the leading section is not possible, the minimum possible potency should be allowed to overflow beyond it to later sections; and even this spill-over should be distributed in the later sections in a decreasing sequence of intensity.

3 Canon of Individualisation.— The principle that the name of any entity — be it of a person, a geographical entity, a corporate body, a series, a document, a subject, or a language — used as the heading of a catalogue entry should be made to denote one and only one entity, by adding to it the necessary and sufficient number of individualising element.

4 Canon of Sought Heading.—The principle that the decision whether an entry with a particular type of heading, or with a particular choice for that heading, or with a particular rendering of that choice, or a particular added entry arising out of it, should

be based on the answer to the question: " Is reader or library staff likely to look for a book under the particular type or choice, or rendering of heading or in the particular added entry ?"

5 Canon of Context.— The principle that the rules of catalogue code should be formulated in the context of the nature of the cataloguing features of the book, prevalent in the mode of book production; the nature of the organisation of libraries. prevalent in regard to the mode and quality of library service; and the coming into existence of published bibliographies and particularly bibliographical periodicals; and that the rules should be amended from time to time to keep step with changes in the context.

6 Canon of Permanence.— The principle that no element in an entry, the heading in particular, should be subjected to change by the rules of a catalogue code, except when the rules themselves are changed in response to the canon of context.

7 Canon of Currency.— The principle that the term used to denote a subject in a Class Index entry of a classified catalogue and in a subject entry in a dictionary catalogue should be the one in current usage.

8 Canon of Consistence.— The principle that the rules of a catalogue code should provide for all the added entries of a document to be consistent with its main entry; and the entries of all documents should be consistent with one another in certain essentials, such as choice, rendering, and style of writing the heading and the other sections (126).

K23 *General Laws*

Besides the above canons there are a few general normative principles which are widely applicable to cataloguing.   They are the

1 Laws of Interpretation;
2 Law of Impartiality;
3 Law of Symmetry;
4 Law of Parsimony; and
5 Law of Local Variation.

Because of their wide application to cataloguing, the specific version of each of the last 4 principles has been formulated as follows:

2 Law of Impartiality.— The principle that between two or more claimants -- say, for use as heading — the preference of any one should be made only on sufficient grounds, and not arbitrarily.

3 Law of Symmetry.— The principle that of two entities or situations which admit of being regarded as symmetrical counterparts of each other, if one of the entities or the situations is given weight in any particular context, the other entity or situation should also be given a corresponding weight.

4   Law of Parsimony.— The principle that between two or more possible alternative rules bearing on a particular phenomenon, the one leading to overall economy of man-power, material, money and time considered together with proper weightage, is to be preferred.

5   Law of Local Variation.— The principle that the International catalogue code should mark out the factors to be left to the care of each national catalogue code; a national catalogue code should mark out the factors to be left to the care of each linguistic catalogue code in a multilingual country such as India; a national catalogue code or a linguistic catalogue code, as the case may be, should mark out the factors to be left to the care of the local catalogue code of each individual library; the catalogue codes in each hierarchical line should be consistent with one another without any mutual contradiction; and each lower link in each hierarchical line should be a supplement to all the upper links taken together (127).

L. Lay-out of Catalogue Code

By the middle of 1950's international thought was turned on a comparative study of the catalogue codes, as a step towards arriving at an agreed international standard for catalogue code. In one of the contributions from India Ranganathan stressed the importance of the lay out of a catalogue code and suggested a standard for it (163). His experience relating to the preparation of the *Heading and canons* helped him much to arrive at this standard for the lay-out. The Doc Sec Com finalised a draft standard for the lay-out of a catalogue code. This draft was adopted on 3 June 1959 (46). The above standard was further revised in 1967.

M   Alphabetisation

Development of principles for alphabetisation of entries drew the attention of S R Ranganathan while he was designing his CCC, Ed 1 (1934). He enunciated two new principles (*See* Sec D28). In 1938, he developed his gestalt theory of alphabetisation (*See* Sec E3). In 1950, he once again made an extensive survey of the basic principles of alphabetisation (103). He found that groups of letters with different spacings, punctuations and other marks, and the introduction of alien characters, gave rise to the possibility for several alternative arrangements. The Doc Sec Com finalised a draft standard on the subject. This draft was adopted on 10 June 1952 (44).

In 1965, Tandon suggested some modifications of the rules of gestalt alphabetisation leading to a slightly different arrangement (207).

N Critical and Comparative Study

A critical examination of a catalogue code can be made with the aid of the normative principles. So also can be made a comparative study of several catalogue codes. Lastly, any catalogue code can be improved in their light.

N1 COMPARATIVE STUDY 1

The first application of such a scientific method to cataloguing and to catalogue codes was made by Ranganathan in 1937 (*See* Sec E3).

N2 COMPARATIVE STUDY 2

The *Heading and canons* (138) contains the results of the second round of comparative study. The Spiral of Scientific Method having been formed in this field, the second round of study began with a chapter on Terminology and another on Normative Principles. Then the several topics in the Choice and Rendering of Headings were taken up successively. The corresponding rules in the five chosen codes — the Anglo-American Code, the Classified Catalogue Code, the Cutter's Rules, the Prussian Instructions, and the Vatican Code — were examined critically and comparatively.

Comparative study is one of the well-known methods for improvements in science and scientific techniques. Perhaps the comparative study of catalogue codes done in India has benefited the revision of ALA Code also. That revision is said to have been founded largely on a memorandum prepared on the subject by Seymour Lubetzky. Though that memorandum makes no reference to the work done in India, Lubetzky has made the following statement in a letter to P N Kaula:

"I met Dr Ranganathan, in spirit, shortly after I left the library school and have followed him since as one of my teachers and guides. I met him in the stack of a university library where I sought answers to questions in cataloguing which puzzled me ... When I read Dr Ranganathan's criticism of our rules, I began to realise that ... it would sometime be necessary ··· to reconstruct our rules ... And for this guidance, among others, I am indebted to Dr Ranganathan" (66).

N3 COMPARATIVE STUDY 3

Such a research project of comparative study of the different editions of CCC with the different editions of the ALA Code (1) has again been taken up. Under this project, A R Desai has completed a comparative study of the corresponding rules of the different editions of the two codes pertaining to the definition of corporate author and of government, the rendering of the name of a government as a whole, and the resolution of homonyms (24).

G Bhattacharyya has compared the different editions of the two codes in the light of the Principle of Unity of Idea taking Rule 58 of Ed 1 of the Anglo-American Code as the sample (6).

S R Ranganathan and G Bhattacharyya have made a comparative study of the definitions of the important cataloguing terms occurring in the two codes. They have shown their mutual impact in their successive editions. Avoidable faults in both the codes have been brought out. Wherever necessary, amendments to some of the definitions of CCC have been suggested (172).

In two other papers on comparative studies, S R Ranganathan and G Bhattacharyya have considered the ways adopted by CCC and ALA Code to resolve the conflict of authorship centring round Person *vs* Person and Person *vs* Corporate Body respectively (173, 174). They have pointed out that CCC resolves the conflict as a preliminary measure before formulating the rules for the choice of Heading of the Main Entry, but ALA Code mixes up the two problems in the rules for the choice of Heading violating the Principle of Unity of Idea in formulating rules.

The research project on the critical and comparative study of the two codes is in progress at DRTC (Bangalore). The results will be published successively in the future issues of this quarterly.

N4 OTHER COMPARATIVE STUDIES

Further, P B Mangla and J L Sardana critically examined the rules of ALA Code (1967) relating to the choice and rendering of corporate author and compared those with the relevant rules of CCC to show the impact of the latter on the former (69).

N5 OTHER CRITICAL STUDY

In 1967, B Guha and T N Rajan evaluated critically the rules 3, 4, 5 and 6 of the ALA Code (1967) in the light of its own four principles underlying the rules for choice of heading and the Paris Principles (37, 100).

In 1968, G N Salvi and B Guha evaluated the provisions of the ALA Code (1967), in respect of the solution of the conflict of authorship centring round the original author *vs* the reviser (183).

P Name-of-Person Heading
P1 FEATURES CREATING PROBLEMS

A name-of-person occurs in most of the entries of a library catalogue. It occurs in the headings of entries. It also occurs in their title-sections. In a heading it may occur as the name of an author, or of a collaborator of one kind or another, or of a person forming the subject of study, or of a person whose name

forms the title of a document. It may occur in a title-section in any of the above ways except as name of author. The varieties of ways in which a name-of-person can occur increases the frequency of its occurrence in entries. A catalogue code has, therefore, to pay special attention to a name-of-person. Its features creating problems in cataloguing are:

1 The number of words in it;
2 Their grammatical nature;
3 Their functions;
4 Their sequence;
5 Their relative potency in alphabetisation; and
6 The complexities in their structure.

These features vary from one linguistic group to another within India. S R Ranganathan carried out an extensive research on each of the features of the names-of-person in each of the linguistic groups of India. This, he did while designing his CCC (1934) (*See* Sec D28). After this, considerable developmental research on names-of-person has been carried out in India. The following subsections of this section deal with those developmental researches.

P2 ASIAN NAME

In 1952, B Sengupta examined the implications of the concerned rules in ALA Code on the rendering of Asian names in the context of

1 Varying spellings of Indic names;
2 South Indian names;
3 Muslim names; and
4 Names of Far East (189).

P3 SOUTH-ASIAN NAME

On 25 March 1951, a meeting of the Second Conference of the Indian National Commission for Unesco held in Delhi under the Chairmanship of Torres-Bodet, the Director-General of Unesco, approved the following resolution of Ranganathan:

"That an Asian Committee be set up [by the Conference of Unesco National Commissions to be held at Bangkok in 1951] to produce an authoritative set of rules for the rendering of Asian Names in bibliographical entries."

The same resolution was also approved by the First Conference of Asian Librarians and the Ninth All-India Library Conference held at Indore on 14 May 1951.

The document, Unesco/Reg Conf II/16 dated 14 September 1951 stated that the proposed Project would be in keeping with the Unesco's programme. A meeting of Mr Carter, the Head of the Libraries Division of Unesco, with a group of Indian Librarians in Delhi on 25 November 1951 formulated the contents and

the stages of the Project. The Regional Conference in Bangkok held from 26 November to 10 December 1951 resolved as follows:

''(4) That consideration should be given to the proposals from the Indian Library Association to undertake the tasks outlined in document, Unesco/Reg Conf 11/16 as follows:

(a) Establishment of a committee for framing standard rules for the rendering of Asian names in bibliographical and catalogue entries.''

On 6 January 1952, Ranganathan prepared a draft Working Paper on the project and circulated it to all the probable participating countries, soliciting opinions (107). In May 1952, several countries sent their general approval of the draft Working Paper. At its meeting held from 21 to 25 April 1952, Unesco's Provisional International Committee on Bibliography and Documentation held in Paris approved the Project and assignment of it to India.

On 12 May 1952, the Indian Library Association assigned the Project to the care of Ranganath n. From May 1952 to January 1953, Ranganathan did field-work and held group meetings in different States of India and in Ceylon. He also held discussion on the subject with the Muslims in Delhi and by correspondence with the librarians in Indonesia, Malaya, and Siam, about the structure etc of the names in the respective linguistic groups.

In May 1953, a pamphlet embodying the findings arrived at by this investigation was circulated to the participating countries (105). Replies were received on the contents of the pamphlet from Ceylon, Indo-China, Indonesia, Pakistan, Siam, Viet-Nam, and the Indian Standards Institution. The final report was despatched to Unesco on 31 October 1953. An important principle formulated in the report on the basis of the Canon of Prepotence was as follows:—

The entry word, in a Name-of-Person, should be chosen from among that group of words occurring in a multi-worded term chosen for use as heading, that is more numerous than the groups of the other words occurring in it. For, the probability for the same word, to be used as entry word in several headings, is inversely proportional to the numerousness of the group from which the word is chosen; and the smaller this probability, the greater will be the concentration of Potency in the entry word. This statistical principle is responsible — unconscious though it might have been — for the choice of the family name as the entry word in rendering a Western Name-of-Person in a heading. So also this principle is responsible for the choice of the personal name as the entry word in rendering a South Indian Name-of-Person in a heading. Sec 72 and 8 of the Annexure to the report contained the following general findings:

"72 It is impossible to make all the cultural groups of the world to conform to a single efficient standard in Name-Formation. But it is possible to agree upon a single efficient standard for printing the name on the title-page. This will easily guide readers in changing over from Title-Page-Name to Entry-Name and *vice versa*.

"8 Laying down of a standard for Title-Page-Name by all concerned including Unesco, ISO, IFLA, FID, and the corresponding bodies in the several countries (along lines suggested below or in alternative ways),

1 The Entry Word or Entry Word-Group, as the case may be, should be printed in Black Face.

2 The Honorific Words, to be omitted in the Entry Name, should not be printed on the Title-Page. If printed, they should be in Roman Cap and lower case, preferably in different lines and in a font of smaller size.

3 Any titular word, which should be included among the Additional Words following the Entry Word (or Entry Word-Group) should be printed in italics.

4 Pseudonym should be separated from real name and printed in a distinctive style in a separate block.

5 Compound Family Names and Compound Individual Names should be hyphenated if the practice of the language does not admit of their being written as one word or if the author habitually separates them" (158).

P31 *Compound South Asian Family Name*
    Ranganathan has worked out lists of the following:—
1 Sinhalese starter word for three-worded family name.
2 Bengalee and Sinhalee starter word for two-worded family name.
3 Compound family names without starter word in Gujarathi, Kannada, Marathi, and Sinhalese (129).

P32 *Removable Attachments*
    Ranganathan has defined a removable attachment as a word or word-group made of common nouns or adjectives, attached as honorific or courtesy term after or before or in the middle of a name, deemed removable, and not to be retained in the heading of an entry. He then gives a list of such removable attachments likely to occur in the Buddhistic, Ceylonese, Indian, Indonesian, Malayan and Viet-Namese names (128).

P4 INDIAN NAME
    1940 Ranganathan and Sivaraman examined the faults committed by the different catalogue codes in prescribing their

respective rules for rendering Hindu names (180). They suggested the adoption of the rules pertaining to the subject in CCC as a remedy.

1957   On the basis of an analysis of the different structures of Indian names, S K Mukherjee emphasised the need for a uniform practice of using surnames (78). He also focussed the problems pertaining to compound surnames and honorary titles used as surnames.

1958   With a view to helping the rendering of Indian names, B Sengupta made an attempt to trace the evolution of surnames among the different linguistic groups in India (194).

1959   B Sengupta examined the problem of rendering Hindu and Muslim names by dividing them into two categories:—

1   Name of authors writing in Indian languages; and
2   Name of authors writing in Foreign languages (193).

Regarding the Indian names in Roman alphabet, he pointed out that the varying spellings of the same original vernacular form, the anglicised form and the dialectical variants presented the biggest problem in rendering (192).

He also gave a set of rules to govern the rendering of Indian names in Roman alphabet (191).

1960   K R Rao suggested to seek legislation to help establish surnames (181).

With a view to standardising the practice of surnames on an all-India basis, B Sengupta suggested, "A personal name with a surname or a word (or words) used as a surname is to be entered under the surname or word (words) used as such" (197). This principle, he said, should prevail even against the popular custom, existing in any linguistic group, of addressing an individual by the given name and not by the surname accompanying the given name.

On the basis of a comparative study of the rules of the different Western catalogue codes pertaining to the rendering of Indian names-of-person, B Sengupta suggested solutions to make up for their inadequacies (195, 196).

To make up the inadequacy of the Western codes in relation to their coverage of Eastern names, he made out a case for the design of linguistic, regional and national catalogue codes (198).

1961   The Seminar on Rendering of Indic names for use in Integrated Alphabetical Catalogue adopted a few resolutions for the guidance of the representative of India to the International Conference on Cataloguing Principles (188).

1963   D C Sarkar reviewed the work done on rendering of Indian names in India and abroad (184). He was of the opinion that there were no principles, generally agreed upon, for the rendering of the names of authors belonging to the different

linguistic groups of India. The construction of a comprehensive author-table for the names of Indian authors he said, was made difficult by the absence of such principles.

P5 SOUTH INDIAN NAME

1960   S Balasubramanian analysed the structure of the names of persons belonging to the different linguistic groups in South India and supported the entry under the Given Name in case the author himself had not modified or contracted his Given Name (3). He illustrated the different ways in which the Given Name is modified by the author himself. He showed further the difficulty in prescribing a general rule for the rendering of the names-of-person belonging to the Christian cultural group in South India.

C V Subba Rao formulated a set of rules for the rendering of Andhra names and gave a formula to ascertain the entry-element (203).

P6 BENGALEE NAME

1959   To help rendering of Bengalee names, S. K Mukherjee compiled a fairly exhaustive list of Bengalee surnames (77).

P7 HINDI NAME

1952   R S Saxena studied the vicissitudes in UP names during the last century and their impact on cataloguing practice with a view to providing some guiding principles to identify the entry element in these names (187).

P8 MAHARASHTRIAN NAME

1960   V B Belsare made an attempt to analyse the attributes of the surnames of Maharashtrians (5).

K S Hingwe compiled a list giving
1 Maharashtrian surnames with their variant spellings;
2 Suggested standard spellings; and
3 Original vernacular forms (40).

PA PUNJABI NAME

1966   To help cataloguers in rendering Punjabi names — Hindu and Sikh — P B Mangla analysed their structure and compiled lists of commonly used complementary words of Hindu and Sikh family names (68).

PB MUSLIM NAME

1960   Jamil Ahmed and B Sengupta analysed the components of the classical Muslim names and of the Indian Muslim

names to show the difference in their respective formation (50). They examined the rules of the different catalogue codes governing the rendering of Muslim names and pointed out their inadequacies. They suggested a solution to the problem in the form of a set of rules on rendering of Indian Muslim names *(See also* Sec P4, Category 1959).

PC ARABIC NAME
1934   Ranganathan studied the structure of Arabic names which generally form the basis for modern Islamic names. It was shown that an Arabic name has usually nine word-groups. On the basis of the Encyclopaedia of Islam and in consultation with some Arabic scholars he framed a set of rules for rendering Arabic names in the headings of catalogue entries. He had put these rules under the caption "Muslim Name" instead of "Arabic Name" in pages 70–79 of his CCC (1934) *(See also* Sec D28).

PD PERSIAN NAME
1959   S Parthasarathy examined the problems connected with the rendering of Persian names and suggested the preparation of lists of words belonging to the various groups of components constituting the structure of Persian names as a remedy (93). He, further, recommended the adoption of the Indian Standard on Supplement to Author Statement as a means of securing uniformity in cataloguing at the international level.

PE TRANSLITERATION
Transliteration of Indian names in Roman script became necessary since the beginning of the nineteenth century for two reasons:—
1   More Indian authors wrote their books in English. The title-page of a book usually mentioned the name of the author in Roman script; and
2   The catalogue entries of most of the libraries were made in Roman script.
But there was no uniformity in the transliteration of Indian names. The International Congress of Orientalists arrived at a standard for transliteration. Based on this and with the help of Mahamahopadhyaya S Kuppuswami Sastri, Ranganathan gave a table of transliteration. This table covers transliteration not only of Indian languages but also for Arabic and allied languages (116).
1958   B Sengupta suggested the adoption of a standard transliterated form for the numerous variants of the same surname as the entry-element for the name of an Indian author writing in Western languages (190).

1959   In pursuance of the above suggestion, he gave a list of standard transliteration in Roman script for Indian surnames showing their variant transliteration in use (192).

1961   Iaslic appointed the Special Committee on Standardisation of Variant Romanised Spellings of Hindu Personal Name. The Committee furnished a standard giving the suggested standardised transliteration of the entry elements of Hindu names-of-person against their various arbitrary transliterations (41).

Since the current renaissance of India and other Asian countries the number of Indian and Islamic authors writing articles in periodicals has become far greater than those writing books in the past. After the advent of Documentation, articles in periodicals have to be catalogued in documentation lists. This has increased the importance of transliteration.

Q Corporate Heading

The problem of corporate authorship is a difficult one calling for much judgment even when the title-page is relied upon. The difficult issues relating to this problem may be grouped as follows:

1 Recognition of corporate authorship;

2 Terminology relating to the chief concepts involved in the study of corporate authorship;

3 Resolution of conflict of authorship centring round corporate body *vs* corporate body;

4 Choice of corporate heading; and

5 Rendering of corporate heading.

Ranganathan carried out an extensive research on these issues before designing his CCC in 1934; and he embodied the results in it and in his *Theory* (1938). His work was followed by a considerable amount of developmental research on corporate heading. The following sub-sections of this section deal with those developmental researches.

Q1 GENERAL

1955   IFLA contemplated an international conference on cataloguing principles. In this connection, Ranganathan wrote two papers on the topics connected with that problem. In one of them, he defined the terms 'Corporate Body' and its four species — 'Government', 'Institution', 'Conference', and 'Organ' (132). He also defined 'Author' and gave criteria for distinguishing between 'Personal Author' and 'Corporate Author'. Again, for the same purpose, he dealt with the problem more elaborately (133). On the basis of the clear-cut definitions of all the chief concepts and terms involved in the study, he

suggested certain draft rules for the choice and rendering of the names of corporate authors.

1960   P N Kaula traced the origin and development of the concept of corporate authorship (58). He analysed the meaning of this concept as given in the different Western catalogue codes with a view to elucidating the ambiguity present in those and to bringing out the advantages of a precise term to denote the concept.

Q2 GOVERNMENT

1941   Ranganathan brought out the anomalies present in the entries of the catalogues of publications of governments (161, 162). These anomalies make it difficult to use government catalogues effectively and fully. He, therefore, proposed a useful standard for adoption by all the governments in India.

1955   On the basis of his experience gained in the comparative study of five important catalogue codes (138), Ranganathan derived from the normative principles of cataloguing a set of draft rules for the choice of governmental author and its rendering in the heading of a catalogue entry (137).

1961   N K Goil made out a case that the name of the country standing for the government concerned should be used only as an individualising element instead of the entry element as provided in the different catalogue codes (34).

Q3 TEMPORARY ORGAN OF GOVERNMENT

1951   R S Saxena proposed that the rule of CCC on the rendering of the names of committees of a government should be amended such that the specific name of the committee formed the main heading and the name of the country was used as an individualising element (186).

1960   C S Krishnamurti examined the rules for the choice and rendering of the names of temporary organs of government in CCC and ALA Code (61). He discussed the "sphere of work" and showed how the entry element could be spotted among the multiworded names. Finally, he suggested that a standardised title-page would solve the cataloguing difficulties presented by the government publications.

Q4 INSTITUTION

1963   Ranganathan examined the usefulness of formulating a rule for the rendering of the name of an institution prescribing that the entry element in the name of an institution was to be the word or the word-group denoting the "sphere of work" (159).

Q5 CONFERENCE

1951   M L Nagar proposed that the rule of CCC on the rendering of the heading for conference proceedings should be so amended as to allow the name of the place of the conference to be used as an individualising element (80). This suggestion was incorporated in CCC, Ed 3.

Q6 HEADING FOR SPONSORED PERIODICAL

1952   Ranganathan demonstrated the unhelpfulness of using corporate author heading for the Main Entry of periodical publications (145).

R Subject Heading: Chain Procedure

Most of the questions arising in a library take the form "What the library has on a specific subject ?" The entries that respond to this question are the subject entries. Here lies the value of this class of entries. Therefore, most of the current research in cataloguing is turned on subject heading.

In response to a specific subject query, the subject catalogue is to disclose to the reader all the books

1 Exclusively devoted to the specific subject;

2 Embodying subjects of greater extension than the specific subject, but having substantial portions devoted to it;

3 Embodying subjects of smaller extension than the specific subject but dealing with some aspect or part of it; and

4 In collateral subjects which contain some information though, indirectly, on the specific subject.

The Classified catalogue and the Dictionary catalogue seek to meet these problems in different ways. But, the problem of choice and rendering of subject headings are common to both of them.

Ranganathan carried out an extensive research on the problem of subject heading. The results of this research was embodied in his CCC (1934) (*See* Sec D28) and *Theory* (1938) (*See* Sec E3). His work was followed by a considerable amount of developmental research. The following sub-sections of this section deal with those developmental researches.

R1 CHAIN PROCEDURE IN RUDIMENTARY FORM

1934   The characteristic index entries, prescribed by CCC (1934), were in reality nothing more than an index to the unit terms in the schedule of Colon Classification. The method of deriving them was the immediate predecessor of the Chain Procedure. In a sense, it was also the Chain Procedure in its rudimentary form, though it was not called so; but, it was entirely dependent on Colon Classification.

R2   VALUE OF CHAIN PROCEDURE
        1950   B C Vickery enumerated the five requirements of
an exhaustive connective index; and he used them as criteria
to evaluate the different types of index (217). As regards an
alphabetical index, he mentioned, "It is thus becoming recognised
in theory that an alphabetical index must be consciously derived
from a systematic organisation of the subject-matter. Ranga-
nathan has even devised a technique 'Chain Procedure' for trans-
forming the relations in a synthetic classification system, such as
his own, into the cross-reference entries, of an alphabetical index.
But, in practice, all too often the synthesis is quite inadequately
developed, and the alphabetical index fails to reveal the inter-
relations of its subject-matter."
        1951   In a review of the BNB, B C Vickery remarked,
"The effect of this method (Chain Procedure) is that the whole
chain of classes is displayed in the index, and even if the user
looks up an entry not corresponding exactly to the subject he
seeks, he is led into the right region of classification.   The
'feature word', he is after, can then quickly catch his eyes.   The
second useful aspect of this procedure is that it displays relations
not displayed by the classified list itself" (218).
        1953   T N Koranne illustrated the use of the Chain
Procedure in arriving at Class index entries to show, among others,
its following achievements:
        1 Mechanisation of the choice and rendering of
subject headings;
        2 Help to a reader who may bring up any isolate in
his subject as the starting point; and
        3 Symbiosis between classification and cataloguing
(60).
        1960   E J Coates said that it was left to S R Ranganathan
to suggest that the method under the name 'Chain Procedure'
should be applied rigorously as a systematic technique for subject
indexing a classified catalogue. He examined the application
of Chain Procedure to study its significant attributes; and he
arrived at the following conclusions:
        1 There can be little doubt that the claims made for
economy of Chain Procedure are justified.
        2 Chain Procedure does offer a methodical treatment
of subject indexing far in advance of any alternative approach
yet propounded.   On the whole, Chain Procedure is a considerable
step towards mechanical subject indexing in a classified catalogue.
        3 Finally, it demonstrates subject relationship by
alphabetical collocation of entries on different aspects of the
same subject. It is limited in this respect only by the extent to
which the scheme for classification used fails to 'modulate' fully

in the listing of terms in hierarchy (17).

J Mills explained how Chain Procedure had solved the problem of a subject index becoming unwieldy by ensuring systematic and economic indexing of every key word constituting the name of a compound subject (75).

1961   J M Elord examined the basic features of the Chain Procedure; and he described it as an original contribution to the development of library science (28).

1964   A Thirumalaimuthuswamy evaluated Chain Procedure from the point of view of its particular advantages in subject cataloguing (208).

R3 ECONOMY BY CHAIN PROCEDURE

1958   B C Vickery showed how, by means of Chain Procedure, the problem of completely flexible generic survey was solved. He established, "Chain Procedure for compounds of up to N terms tends to need 2N entries, multiple entry to need $1 + 2 + \ldots + N$ entries, which is greater than 2N if N = 3". He demonstrated also the adoption of Chain Procedure for deriving subject headings on the basis of the faceted scheme for classification included for the test of its efficiency in the Aslib Research Project at the Cranfield College of Aeronautics (215).

R4 APPLICABILITY TO ANY SCHEME

1946   M L Nagar illustrated that the Chain Procedure was a definite, impersonal, mechanical, and objective method of deriving the specific subject heading as well as the headings of the *See also* subject entries (79). He stressed that a scheme for classification, even if it was faulty, might be of some help in deriving the subject headings. The effectiveness of the procedure, he concluded, would reach its ideal if the scheme for classification was a helpful scientific one satisfying all the canons of classification and observing the ideal of co-extensiveness.

1947   P K Garde showed that the Chain Procedure prescribed by CCC (1945) would be equally applicable to any scheme for classification (31). Further, he suggested some modifications to the rules of Chain Procedure specially in regard to complex subjects.

1955 J Mills demonstrated the application of Chain Procedure to Class Numbers in all the major schemes for classification — DC, UDC, LC, BC, and SC; and he concluded, "so long as the principle of an efficient division of labour is observed — not repeating in the alphabetical index work (*i e* division of a subject) which has already been done in the classification, then Chain Procedure can be applied successfully and easily to all the major schemes; whatever kind of notation they use, even to the

Subject Classification, whose structure is quite different from all the other schemes" (74).

R5 APPLICATION TO DC
1955   Success of an experiment of deriving subject headings by Chain Procedure based on DC class number was reported by D W Doughty of the Queen's College Library (25).

R6 APPLICATION TO DC IN BNB
1951   As regards the procedure of deriving subject headings prescribed in CCC (1934), Ranganathan said, "Rule 31 and its subdivisions are not altogether without some useful suggestions when a different classification scheme is used". Regarding the Chain Procedure prescribed in his *Theory*, Ranganathan said, "Apart from these general hints which may be applied in association with any scheme of classification, each scheme of classification needs special rules to facilitate objective determination of headings for the specific subject entries. The better the scheme satisfies the canons of classification the fewer will be the special rules required ... ". Developments in this direction first took place in 1951. B I Palmer and A J Wells demonstrated how the Chain Procedure could be adapted to derive subject headings and feature headings on the basis of class numbers of an enumerative scheme for classification, such as DC (89). They enumerated the difficulties that would arise also, together with the method of dealing with each difficulty. Their findings ultimately led to the adoption of the Chain Procedure for the BNB with necessary modifications of its rules.

1954   J Mills gave a demonstration of Chain Procedure based on DC Class number as practised by the BNB; and he pointed out its specific advantages (76).

1957   The BNB experienced a number of difficulties in applying the Chain Procedure to the DC class numbers. A J Wells attributed those difficulties to the structural defects of DC; and he explained how the BNB resolved some of those difficulties (218).

R7 MODIFICATION IN INB
1958   Commenting on the modification of the Chain Procedure in the experimental fascicule of the Indian National Bibliography, A J Wells said that it was an attempt to achieve economy at the cost of convenience. He further said, "Of course, for the 448 items listed, she (Law of Parsimony) may have her head and no great harm done, but even if there were only ten times this number of items, I think we would find the index exasperating" (219).

R8 CHAIN PROCEDURE AND DEFECTS IN CLASSIFICATION

1957 J Mills showed that as a procedure for deriving a subject heading, Chain Procedure was not very much disturbed by the defects in the scheme for classification forming the basis (73). Of course, he admitted that if the chain was not clear, due to defects in the scheme for classification, then the post-indexing step was to that extent less efficient.

1959 H N Ananda Ram showed that the weakness of the subject headings derived by Chain Procedure was largely due to the faults of the scheme for classification used (2).

RA CHAIN PROCEDURE AND DEFECTS IN DC

1960 E J Coates distinguished the problems relating to the application of Chain Procedure to DC as follows:

1 A notation is primarily a means of mechanising the order of terms in a systematic sequence. It need not necessarily reflect the hierarchical relations between terms, and in DC it often does not. So it is insufficient merely to rely on the digits of DC class number to produce all necessary entry words.

2 The other class of problem arise from omissions and errors in the classification schedule itself. A fairly common difficulty in chain indexing from DC arises from incomplete modulation of terms in hierarchy.

3 Whereas in chain procedural indexing to the Colon scheme, the subject indexer can virtually limit the field of his concern to the digits of the notation, in applying the technique to the Decimal Classification, he must maintain a close watch on the classification schedule of terms as well (16). Along with this, he recorded his experience of adapting Chain Procedure for the BNB and the British Catalogue of Music.

RB POSTULATE BASED SUBJECT HEADING

The term 'Chain Procedure' essentially denotes a systematic way of deriving subject headings. It implies the

1 Analysis of a subject into its components according to a set of postulates and principles;

2 Arrangement of the components in a definite sequence according to a set of postulates and principles; and

3 Derivation of the desired specific subject heading and of the referred-from subject headings on the basis of the sequenced components of the subject concerned.

In fact, the rules of Chain Procedure can be so formulated as to yield several alternative patterns for the arrangement of the components of a subject heading (130).

1953 A development of Chain Procedure in this direction took place in the method of deriving subject headings developed

by A Thompson. His method was based on a system of subject analysis into six elements: Realisation, Material, Processes and Problems, Place, Time and Form (209).

1963   Another development of Chain Procedure in the same direction took place in the method of deriving subject heading for the British Technology Index. This was reported by E J Coates (13).

1964   S R Ranganathan showed how the choice of the name of the subject of a document and the rendering of the name in the heading of the specific subject entry can be got by facet analysis based on postulates and principles (165). After showing that subject headings constitute an artificial language, it was pointed out that using facet analysis for subject heading did not amount to using class number.

1969   Ranganathan discussed the difficulties in the use, preparation and maintenance of predetermined subject headings using *L C Subject headings* as the type. He show that the first five steps in the systematic procedure for subject analysis, based on postulates, for the post-determination of Class Number were also steps for determination of Subject Headings. The further steps in the procedure for classifying were not at all necessary to determine the Subject Heading. It was not necessary to march on in the procedure up to the Class Number and then come back to Subject Heading on the basis of the Class Number. He discussed the problems awaiting pursuit in the improvement of the post-determination of Subject Heading in respect of the syntax of the ideas in the Forward Multiple Subject Headings used for *See* reference. In this connection, he mentioned about the DRTC experiment in the possibility of removing the residual difficulties by the use of Indicator Digits (164).

RC CHAIN PROCEDURE AND BTI

1964   E J Coates described 'Chain Procedure' as an alternative to arbitrarily limited permutation of index components (14). He discussed its economy together with the problem of unsought headings and the need to exclude genus-species pairs from qualifying terms. The role of Chain Procedure and its limitations in drawing attention to "distributed relatives" were also indicated by him. Finally, he explained its adaptation for the alphabetical subject catalogue and for the construction of subject headings for the British Technology Index.

RD CHAIN PROCEDURE AND MICRO DOCUMENTS

1968   A Neelameghan and G Bhattacharyya showed that the class index entries derived by applying Chain Procedure to the full class number of a micro-subject was unhelpful. They

suggested that a micro-subject should be treated as a multi-focal one, and divided into convenient smaller compound subjects going with one and the same basic subject. A main entry, they said, could be prepared for each of these compound subjects and class index entries derived from each class number by applying Chain Procedure. A method of rendering the class index entries by cyclic permutation of the terms which would preserve the syntax was also demonstrated by them. The depth classification of motor vehicle production engineering was used to illustrate the new techniques propounded by them (86).

RE CHAIN PROCEDURE AND COMMISSION REPORT
    1960   N K Goil examined the status of and the manner in which the *ad hoc* commissions were appointed in order to determine the headings of the entries for their reports. He made out a case for the need of using the name of the Chairman of the commission as a heading in the entries, in addition to the corporate author heading. He suggested a few additional rules for incorporation in CCC, in order to satisfy the various approaches of readers (33). In Colon Classification a commission report is treated as a quasi-subject. In the light of Goil's suggestions, special rules were formulated for deriving class index entries from the last sought link of the chain contributed by a class number for a commission report. These rules were incorporated in CCC (1964) as chapter KJ.

RF SOUGHT HEADING
    1964   Ranganathan suggested an objective statistical survey of sought headings for subject entries. (165).

RG SINGLE NOUN IN NOMINITIVE CASE
    1952   According to Rule 311 of CCC (1951), the Class Index heading to be derived from the last sought link of the chain contributed by the class number V2: 2 was to be "Constitutional History, India". R S Saxena pointed out that the practice was wrong; and he enumerated the correct heading as "Constitution, India, History" (185). In that connection, he suggested that each heading — main or sub — in a multiple subject heading should, as far as practicable, be a single noun. If the schedule of Colon Classification was to be used for this purpose, he remarked, it was to be designed accordingly.
    1962   One of the rules of Chain Procedure reads as follows: "Each Heading or Sub-Heading is to be single noun except when a qualifying adjective is necessary." To facilitate its application, M N Ramakrishnan furnished the proper interetation of the rule with illustrative examples (101).

RH USE OF CONSTITUENT TERM
    1965   In the context of subject headings derived by the
Chain Procedure from class-number of microdocuments embodying
subjects going with the Host Subject "Production Engineering
of Electron Tubes", V V Parthasarathy suggested the substitu-
tion of composite terms by constituent isolate terms in the
subject headings as it would ensure 50 per cent economy in
practice (94).

RJ RESOLUTION OF HOMONYM
    1963   S R Ranganathan detected that the incidence of
homonyms among class index headings increases with the inten-
sion of the class numbers from which the headings were derived
by Chain Procedure (142). As a means of resolving the homonyms,
the use of auxiliary words with semantic value but without ordinal
value was provisionally suggested by him.
    1965   A Neelameghan and M A Gopinath distinguished
the different kinds of homonyms that might arise when class index
headings were derived by Chain Procedure from Colon class
numbers (87). They showed that the homonyms could be
resolved either
    1 By inserting appropriate auxiliary word or individualising
element or both and also making use of the Canon of Context
and the Canon of Decreasing Extension; or
    2 By inserting appropriate auxiliary word or individualising
element or both in all the homonyms.
The advantages and the disadvantages of both the methods were
also commented upon by them.

RK UNSOUGHT LINK
    1952   To control the number of class index entries,
M L Nagar suggested the introduction of the concept of "unsought
link" (81). The impact of this concept on the Canon of Ascer-
tainability, the Law of Local Variation, and the Canon of Con-
sistence was also brought out by him.

RL STYLE OF WRITING SUBJECT HEADINGS
    1965   Sugra Begum and Afroze Fatima explained the
need for standardisation of the style and rendering of subject
headings derived by Chain Procedure in a frozen bibliography,
particularly a printed one (206). They compared the style and
rendering of subject headings in the BNB, the INB, and the article
entitled 'Medical radiology: depth classification' (Lib sc. 2;
1965; Paper G). On the basis of this comparative study, they
recommended the style followed by the last mentioned one as
a standard indicating the modifications necessary.

RM   FEATURE HEADING BY CHAIN PROCEDURE
      1965   D Gundu Rao prescribed a helpful method and
style of rendering feature headings derived by Chain Procedure
for a weekly documentation list having its entries arranged in
a classified sequence (39).

RN   CHAIN PROCEDURE AND DICTIONARY CATALOGUE
      1953   The Chain Procedure could be used to derive
subject heading for the dictionary catalogue also. But the rules
of the Chain Procedure applicable to the Classified Catalogue
were not equally helpful to the dictionary catalogue. In 1954,
Ranganathan showed this unhelpfulness (111). He emphasised
the need of further research to establish a helpful set of rules of
Chain Procedure for use in the dictionary catalogue.
      1957   E J Coates furnished useful notes with numerous
examples on the general principles to be followed to adapt the
rules of Chain Procedure for deriving subject headings to meet
the requirements of the dictionary catalogue (18).
      1960   Representation of a Class number in the form
of a Chain and deriving subject headings from the sought links
must not be in accordance with the requirements of an "alpha-
betico-specific catalogue". Taking the Chain Procedure as a
mechanical way of deriving subject headings, Coates demonstrated
how to adapt it for the preparation of multiple subject headings
to meet the requirements of an alphabetico-specific catalogue
(15).

RP   ALTERNATIVE RULES FOR CHAIN PROCEDURE
      1964   H D Sharma pointed out the prerequisites for
the success of the Chain Procedure, and the difficulties arising
from terminology and from the concept of unsought links (2C0).
He suggested certain modifications of Chain Procedure which
would arrange the terms in a subject heading in a sequence quite
in line with the approach of the reader to the subject heading.
The practice of permuting the terms in a subject heading was
shown to be quite uneconomic.

RQ   CHAIN PROCEDURE AND   SUBJECT HEADINGS IN INDIAN
      LANGUAGES
      1963   The application of Chain Procedure to derive
subject heading in Indian languages has been a problem of research
for a long time. P N Venkatachari showed the usefulness of
applying Chain Procedure for deriving specific subject headings
in Indian languages (212).
      1965   At the end of 1965, a good amount of research
was carried out on adapting Chain Procedure for deriving subject

headings in Indian languages. R S Parkhi demonstrated how to adapt the rules of Chain Procedure for deriving subject headings in Marathi (91). He suggested also a few devices to resolve homonyms in subject headings in Marathi.

C P Barot demonstrated how to adapt Chain Procedure for deriving subject headings in Gujarathi (4).

K A Issac and M N Ramakrishnan devoted their research on the use of Chain Procedure for deriving subject headings in Malayalam (49).

C V Subba Rao showed the way of using Chain Procedure for deriving subject headings in Telugu (204).

P B Roy and G Bhattacharyya evaluated the prevalent practices of constructing subject headings in Bengali (182). They examined the application of Chain Procedure for deriving Bengali subject headings. The problems special to this context were also indicated by them together with suggestions for necessary adjustments.

RR PROBLEMS FOR RESEARCH IN CHAIN PROCEDURE

1965 S R Ranganathan pointed out the versatility of Chain Procedure in arriving at a preferred and consistent pattern of subject headings and in formulating feature headings (110). He showed that the use of the Canon of Context effects considerable economy in the use of words in subject headings and feature headings. He mentioned that the problems in formulating a multiple subject heading provided a rich field for research by a team of librarians, linguists and psychologists.

RS CHAIN PROCEDURE NOT HELPFUL

1960 The Aslib-Cranfield Investigation—I made an attempt to determine the comparative efficiency of indexing systems (11). Four systems were chosen for comparison. They were

1 The indexing system based on UDC;
2 The alphabetical subject catalogue;
3 The indexing system based on a faceted scheme for classification; and
4 The uniterm system of co-ordinate indexing.

Among these, for both the systems based on two different schemes for classification, Chain Procedure was adopted for the preparation of the supplementary alphabetical subject index. It was shown that the subject index constructed by following the rules of Chain Procedure did not provide a comparatively efficient means of "entry" into the classified part arranged according to class numbers (12).

5

RT MISUNDERSTANDING AND MISREPRESENTATION

1959   J Metcalfe's research on Chain Procedure led
him to remark, "It (Chain Procedure) appears to be based, at least
so far as it is applied to the dictionary catalogue, on misunder-
standing and even perversion of what Cutter said and meant
... He (Ranganathan) claims Cutter's authority when it suits
him and rejects it when it does not" (72). Another remark made
by him was as follows: '·Chain analysis of class numbers will not
yield all that is required unless numbers are specially compounded
for the purpose. For example, when the heading Duelling is
established hierarchical references are to be made to it from
Ethics or Social Ethics and from Manners and Customs, and a
collateral reference is desirable from Fencing. By special rules
the compound number 394.8: 179.7: 796.86 might be made to
yield them; none of the simple numbers will; and there is still
a 'see' reference in Sears' list from Fighting to Duelling and other
special forms of fighting, which is not implied even in this triple
compound. Only one number is required for the shelf classifi-
cation of a book on Duelling, and a cataloguer could get all the
necessary cross-reference out of his head and/or a subject headings
list in no more time than would take to analyse his shelf number,
and certainly in less time than it would take him to discover the
other numbers and analyse them. The method may also be said
to put the cart which is the class number before the horse, which
is the entry and reference headings, and which can in any case
stand by itself, without any support from the cart, and is a freer,
more flexible animal without the cart; to vary the metaphor
Chain Procedure may be but a tin can tied to the tail of the dic-
tionary catalogue" (71). In the same context, he said further
that he did not believe "that an orderly arrangement of subject
material must be or should be based on subject classified arrange-
ment". He concluded, "Far from being a defect, the dictionary
catalogue's freedom from the class relations of any particular
classification scheme is one of its great qualities and advantages.
And of course if headings and references are tied or chained to a
numbered hierarchical classification it must be to a particular
one." Commenting on BNB's adoption of the Chain Procedure,
he raised the following questions: "Of course, the filling or com-
pilation is facilitated, as it is in the dictionary catalogue, if the
arrangement is merely word by word ignoring punctuation, or
making this uniform. But what about consultation, when there
is a fairly rigid adherence to indexing by Chain Procedure, and
to one method of relating terms, without regard for functional
differences in the relation ? And is it not strange when so much
is thought of Ranganathan's distinctions of relations and some-
thing is attempted in the Subject Section of BNB, the distinctions

are not thought to matter in the Alphabetical Section, which must be a user's first point of contact with the bibliography ? His ultimate remark about the BNB was " It is not satisfactory cataloguing because there is not the multiple entry which alone will bring the literature of a subject together even as far as classification will allow this, and it is not even as satisfactory as alphabetically indexed single entry can be because of the defects of Chain Procedure" (70).

S Subject Heading: Other Method
Besides the research on Chain Procedure, some work has been done on Cyclic Indexing and Keyword Indexing, also.

S1 CYCLIC INDEXING
H Bose and T S Rajagopalan suggested modifications to the cyclic indexing method for a multiple entry system prescribed by the *Guide to UDC* (BS 1000C: 1963) to render it suitable for application in a single entry method (7, 9).

S2 KEYWORD INDEXING
H Bose with S Dutta outlined the main features and principles of Keyword Index of the *Indian Science Abstracts* (8).

T International Effort for Uniform Cataloguing
A rigorous catalogue code is of recent origin. It first attained rigour in stray local codes of individual libraries. Now, it is attaining rigour in national codes. CCC with its normative principles, rules for language and script, and definitions of cataloguing terms, is perhaps the first rigorous catalogue code of translocal application. A truly rigorous catalogue code of international application is yet to evolve. Nor is there any international agreement on cataloguing rules. This section deals with India's constitution to the international effort for uniform cataloguing.

T1 SCOPE OF INTERNATIONAL CATALOGUE CODE: VERSION 1
In 1953, in order to determine the scope of an international catalogue code, S R Ranganathan examined the different codes in regard to the choice of personal author heading and pseudonymous heading. He examined the difficulties caused by translation and transliteration also. With this as background he established the essential need to adhere to the Canon of Ascertainability. The difficulties about corporate authorship and of the headings of periodical publications were also analysed by him in this connection. On the same occasion, he enunciated and used the Principle of Least Range of Search to solve problems.

Dividing the problem of preparation of an entry into three sub-problems — choice, rendering, and recording — he established that 'recording' could not be subjected to international codification. He singled out the following problems as important ones needing international agreement and incorporation in the international catalogue code:

1 Rendering of Asian names;
2 Rendering of corporate names — that is, names of governments, institutions, and conferences;
3 Transliteration; and
4 Headings for periodical publications.

Ranganathan emphasised that the international catalogue code should not be ventured upon until a rule-by-rule comparative study of the important existing catalogue codes was made (148).

T2 GENESIS OF PARIS CONFERENCE (1961)

At the instance of UNESCO, the IFLA Conference held at Zagreb (Yugoslavia) in 1954 took up the problem of arriving at some international agreement about uniform standard for cataloguing. After a short discussion, Piere Bourgeois (Switzerland), the then President, called on S R Ranganathan to outline the problems that might be taken up. Ranganathan analysed the problems for discussion. He also arranged them in the sequence of priority. He said that the most outstanding problem was that of the recognition of corporate authorship — that is, of a government or its organ, or an institution, or a conference responsible for a document being treated as its author for the purpose of choosing the heading for its catalogue entry. He, however, added that this subject might not yield much result as there were two totally opposite practices in the world and that this problem should not, therefore, be taken up as the first one. However, Hofmann, the Director of the State Library of Munich, said that the German librarians, who had been treating governmental publications as anonymous books, were already beginning to concede the advantage of treating them as of corporate authorship. This statement resolved the two apparently irreconcilable schools of thought. Therefore, this subject was put up as the first item for international study. To pursue this question, the IFLA established a Working Group with Frank C Francies (U K) as Chairman and the Secretariat in London. It was also agreed that the important systems of cataloguing practices prevailing in the world should be represented in this study. These were the British, the American, the Scandinavian, the German, the Vatican, and the Indian systems. In spite of this direction, the Indian system was not included in the actual working paper. On Ranganathan's raising this point, strangely the reply received

was that it was an unintended omission. However, the Secretary was in touch with Ranganathan all along in the pursuit of the problem (150).

T3 SCOPE OF INTERNATIONAL CATALOGUE CODE: VERSION 2
    In this connection, in 1955, Ranganathan made a critical study of the sections on corporate author heading found in the Interim Report of the Francis Committee (143). He pointed out the consequences of the failure to start with a provisional definition of each of the chief concepts and terms. He showed the patchiness and the omission of many important problems in the "Points for further study" given in the report.
    In the same year, Ranganathan elaborated the problems relating to corporate authorship further (133). He provided for all the terms involved and suggested certain draft rules as the basis for discussion at the international level. Reprints of Ranganathan's paper on the subject, published in the *Libri*, was circulated to all the members of the committee which met at Brussells.
    By this time, Ranganathan furnished the skeleton for an international catalogue code for books of the past (146). The sphere of a supplementary national code was shown to consist of style of writing and printing, and certain essential schedules concerning names-of-persons, in the linguistic groups.

T4 SCOPE OF INTERNATIONAL CATALOGUE CODE: VERSION 3
    In 1959, S R Ranganathan justified the attempt to organise an international conference on cataloguing which would prove a good first step towards a standard international catalogue code. He analysed in detail the problems regarding standardisation at nine different levels. He then sorted out the problems into those amenable to international catalogue code, national catalogue codes, and local catalogue codes respectively. Finally, he made an appeal for international effort to continue making closer approximation until an agreed international catalogue code would be reached (147).

T5 EVALUATION OF PARIS PRINCIPLES 1
    In 1962, Ranganathan examined in detail the *Preliminary official report* of the International Conference on Cataloguing Principles (Paris) (1961). He analysed clause-by-clause the prescriptions given in the *Report* regarding scope, functions, structure of a catalogue, kinds of entries, multiple entries, choice of uniform heading, single personal author, entry under corporate bodies, collections, works, entry word, etc. Wherever necessary, he suggested alternative prescriptions. The implications of the

prescriptions were examined in the idea plane and in the verbal plane (151).

T6   EVALUATION OF PARIS PRINCIPLES 2

In 1969, Ranganathan furnished an evaluation of the principles formulated by the International Conference (Paris) (1961) based on the Annotated edition of the *Statement of principles*. He showed that the heading recommended for the author entry of laws, constitutions, and treatises, converted the entry into a subject heading. He suggested a method for the treatment of such books so as to preserve the main entry as a strict author entry. It was shown that the prescription in regard to change of name of a personal author involved the violation of the Canon of Permanence in the case of a living author. He suggested that the Canon of Ascertainability which was accepted in the case of a corporate author should be used in the case of a personal author also. The dead hand of tradition, he remarked, vitiated many of the recommendations of the Paris Conference. He said that finding a compromise among the differing traditional practices was not sufficient. In regard to an entry for joint authors, he found that even a compromise could not be effected. As a corrective, he suggested that another session of the conference should be held to formulate agreed normative principles for cataloguing, and, based on them, a standard practice for cataloguing should be derived for future use (109).

U   Cataloguing of Future Books and Author Statement on Back of Title-Page

The choice and rendering of the information in the entry for a book is usually based on the information embodied in its preliminary pages. The make-up of these pages has passed through various stages of evolution since printing was invented. At present, preliminary pages are made up in ways corresponding to all the different stages. Sometimes they do not conform to any principle. This has been responsible for causing the inconvenience and waste of time in cataloguing books of the past and of the present. It is, therefore, desirable to prescribe and follow a standard practice in embodying the information in the different constituents of preliminary pages and in the sequence in which these constituents should appear. This is the only way to avoid the wastage of cataloguing energy in the case of books of the future. The following sub-sections deal with India's contribution in promoting the standardisation of information on the back of the title-page.

U1 HOMONYM CHANGE OF NAME AND PSEUDONYM IN AUTHORSHIP
    In 1954, Ranganathan examined the cataloguing difficulties
caused by authors of different books having the same name
and by the same author writing under different names including
pseudonyms. He appealed to authors and publishers to co-
operate by giving in the preliminary pages the date of birth and
all the names including pseudonyms under which they have written
different books (106).

U2 VARIETY OF STRUCTURE IN INDIAN NAMES
    In 1954, on the basis of an analysis of the structure of
Indian names, Ranganathan made out a case for a standard of
the information to be given on the title-page, as a help to cata-
loguing (144).

U3 VARIETY OF CUSTOM IN FORMING NAME
    In 1954, by means of a detail review of customs in forming
names in various parts of the world, Ranganathan showed that
it was impossible to frame rules for languages outside those of
Europe, that would enable a cataloguer, not familiar with the
language in question, to determine the proper form of entry
for a name of person. He showed that the labour and knowledge
needed to draw up long list of names to help the cataloguer was
prohibitive. As an alternative, he suggested the adoption of an
international standard for the title-page indicating by typographical
means, the entry element, the secondary element in the name of
the author, and the other elements in it that may be ignored by
the cataloguer. The verso of the title-page, he said, would also
be used for other information important for cataloguing, such
as the author's dates and any change of name. He also reite-
rated his recommendation mentioned in Sec U1. (169).

U4 EFFORT OF INDIAN STANDARDS INSTITUTION
    The problem mentioned in Sec U3 was brought up by
Ranganathan before the Brussells Meeting (1954) of the Technical
Committee 46 of the International Standards Organisation.
Though there was opposition to it, the meeting finally included it
among the subjects to be taken up by ISO/TC46. However,
the secretariat said that it could not itself take it up, but would
leave it to the care of India. In 1955, the Indian Standards
Institution took up the problem through its Doc Sec Com. The
pertinent drafts were finalised on 2 December 1955; and they
were adopted on 24 January 1956 (45, 47). Immediately, there-
after, it was forwarded to ISO/TC46 for wide circulation, con-
sideration and adoption. But the original reluctance of the
ISO/TC46 to accept India's proposal persisted even thereafter;

and no action on it appears to have been taken by it till now.

U5 IMPACT OF INDIAN STANDARD

In 1959, Ranganathan examined the attributes of multi-worded names-of-person as well as of the words constituting a multiworded name-of-person. He analysed the impact of adopting the Indian Standard for Supplement to Author Statement on the cataloguing of modern books and books of the future (153).

U6 UNIFORM RULE FOR RENDERING NAMES-OF-PERSON

In 1960, Ranganathan showed the impracticability of an International Catalogue Code giving precise detailed rules for the rendering of names-of-person in the heading. He reiterated the universal implementation of a standard for the printing of the entry statement on back of the title-page of a book to take the cataloguing profession away from that of historical biblio-graphy. He recommended, further, the replacement of con-junction and instrumental preposition in catalogue entries by universally used punctuation marks (154).

U7 FAMILIARITY WITH LINGUISTIC GROUPS

In 1962, Ranganathan illustrated the need for an intimate knowledge, on the part of the cataloguer, of the practices in regard to names-of-person in different linguistic groups. This task is now becoming formidable as persons of several linguistic groups have begun to write books, and as copies of these books are taken by libraries in several linguistic areas. He showed how the inter-national adoption of the Indian Standard on Supplement to Author Statement would relieve the cataloguer of the task of informing himself of the Naming Practices of different linguistic groups (155).

U8 SIMPLIFICATION OF NATIONAL CATALOGUE CODE

In 1955, Ranganathan outlined the content of a national catalogue code as a supplement to the International Catalogue Code (*See* Sec T3). He mentioned that it was to consist of style of writing and printing, and certain essential schedules concerning names-of-person in the linguistic groups. In this connection he indicated that the automatic disappearance of the need for the later, after the adoption of an international standard practice for Author Statement on the back of the title-page, would result in simplified national catalogue codes and the international catalogue code for the books of the future (146).

UA BYPASSING PROBLEMS OF DRAFTING A CATALOGUE CODE

In 1959, Ranganathan sorted out the cataloguing problems

into those amenable to international catalogue code, national catalogue code, and local catalogue code respectively (*See* Sec T4). Incidentally, he showed the possibility of bypassing many of the problems by promoting an international standard for the supplement to Author Statement on the back of the title-page (147).

UB MINIMISING LABOUR IN CATALOGUING

In 1961, Ranganathan pointed out the futility of depending on title entries for literature search. He traced the dependence on an unhelpful multiplicity of rules for the rendering of a name-of-person or for the choice and rendering of a corporate author's name to an inheritance from the past. For the conservation of cataloguing man-power he recommended the adoption of the Indian Standard for the Supplement to Author Statement on the back of the title-page. The consideration of the best way of bringing to the notice of a reader all the books related to the book engaging his attention at the moment was also recommended by him (149).

UC CATALOGUING GF FUTURE BOOKS

In 1962, while evaluating the *Preliminary official report* of the International Conference on Cataloguing Principles (Paris) (1961) (*See* Sec T5), Ranganathan showed how the conference was mainly biased towards past and paid little attention to look into the future. He recommended the adoption of the Indian Standard for Supplement to Author Statement as a step to facilitate cataloguing of future books (151).

UD BASIS FOR THE SECOND INTERNATIONAL CONFERENCE ON CATALOGUING

In 1969, Ranganathan showed that the cataloguing rules for the books of the past bristled with difficulties, as the title-leaf of such a book did not conform to any standard. He proposed that in collaboration with the publishing and the printing trades, the library profession could bring about a standard for the title-page and its back. This standard, he said, would make the title-leaf give all the necessary cataloguing information for the books of the future. He suggested standards for personal author statement, corporate author statement, collaborator statement, supplement to author statement, and supplement to collaborator statement to be printed on the back of the title-page indicating the consequential simplification of the cataloguing rules. This standard, he suggested, should form the basis of the second international conference on cataloguing (160).

V Research in Other Areas

Research in the major areas of cataloguing have been de-
cribed under appropriate headings in the Sec H to U of this paper.
This section deals with research in the residual areas in cata-
loguing.

V1 SYMBIOSIS BETWEEN CLASSIFICATION AND CATALOGUING

1950   P K Garde and S Parthasarathy proposed that
wherever classification was unable to reveal the association of
books, the catalogue should undertake to do that.   With this idea
in view, they suggested a few additional rules to be incorporated
in CCC and DCC to make provision for an Associated Book
Note in the main entry of such books (32).

1961   S R Ranganathan and T Ranganathan pointed out
that classification failed to disclose collateral relation, series
relation, and relation of associated documents. They showed
how this function of disclosing these relations could be left to
cataloguing (179).

V2 CLASSIFIED CATALOGUE vs DICTIONARY CATALOGUE

1954   D Subramanian indicated some of the difficulties
of the dictionary catalogue. He showed how they could be over-
come by the classified catalogue (205).

V3 EVALUATION OF RANGANATHAN'S CONTRIBUTION TO CATA-
LOGUING

1963   N Dutta surveyed briefly Ranganathan's views
on cataloguing as exposed in his major works (23).

V4 EVALUATION OF IDEOLOGIES OF THE PARIS PRINCIPLES AND OF
ALA CODE (1967)

1963   H D Sharma furnished a criticism of the ideology
governing the revision of the ALA Code (1967) and the formula-
tion of Paris Principles (199).

V5 JOINT AUTHORS

1964   P B Mangla pointed out with an illustrative example
that a joint authorship might consist of one personal author and
one corporate author. He suggested that CCC should recognise
such a case and make provision for the choice and rendering of
the heading of the main entry in such a situation (67).

1965   D Gundu Rao showed with an illustrative example
that a joint authorship might consist of one pseudonym and one
real name-of-person (38).

V6 PSEUDONYMS AND ANONYMS

1961   On the basis of a detailed study, S B Joshi made

out a case for the need of language-wise dictionaries of pseudonyma and anonyma in India to facilitate cataloguing work (55).

V7 PSEUDONYM

1963 M M Shukla examined critically the rules of CCC and ALA Code relating to the choice and rendering of pseudonyms with a view to suggesting their improvements (201).

In the light of the criticism made by Shukla, Ranganathan agreed to amend the rules of CCC relating to the choice and rendering of pseudonyms in the heading (157).

1965 Verendra Kumar evaluated the rules concerned with the choice and rendering of pseudonyms in both CCC and ALA Code (214).

1966 Verendra Kumar compiled a dictionary of pseudonyms in Indian literature (213).

V8 INDIA'S ANONYMOUS CLASSICS

1963 For the consideration of the National Committee for Cooperation with IFLA, a draft list of uniform headings for Indian anonymous classics was compiled (65).

VA CONFLICT OF AUTHORSHIP

1964 N K Goil analysed the cataloguing difficulties arising out of the conflict of authorship centring round person *vs* corporate body in case of National Sample Survey Reports with a view to suggesting a solution in favour of choosing the name of the personal author(s) for the heading of the main entry (35).

VB AUTHOR'S NAME MERGED IN THE TITLE

1963 S R Ranganathan and A Neelameghan isolated out sixteen possible varieties of the author statement on the title-page of books in which the name of the original author was merged in the title. They discussed in detail the problems relating to the choice of heading of the main entry of such books. Following the Canon of Ascertainability was shown to be the safest course of arriving at a consistent practice (177).

VC POSTHUMOUS EDITION OF AN AUTHOR'S WORK

1968 M N Kashyap examined the provision in CCC regarding the choice of the heading of the main entry for a work, the authorship of which was changed after a revision (56).

VD MERGER BOOK

1954 K D Puranik detected the inadequacy of CCC

(1951) in regard to the cataloguing of merger books. He suggested amendments needed in CCC (97).

VE MAIN ENTRY AS SOURCE OF ADDED ENTRY

1963   M N Ramakrishnan argued that the main entry need not necessarily be the source of all the added entries (102).

VF CRITERIA FOR TITLE ENTRY

1952   P N Kaula proposed that

1 The heading of the main entry for a ready reference book should consist of the title of the book; and

2 A title index entry is to be given for a book of corporate authorship and for one having a proper name in its title (59).

VG PUFFS IN TITLE

1963   S R Ranganathan explained why two different symbols — that is, 'three dots' (...) and 'etc' — were prescribed to represent the same idea of omission of puffs in a title (156).

VH RENDERING OF COLLABORATOR'S NAME IN THE TITLE SECTION

1964   P D Upadhyaya and G Bhattacharyya demonstrated the helpfulness of rendering the name of a collaborator in the title section in the way in which it is rendered in the heading section. They indicated the economy that would be achieved by this practice in writing the tracing section (211).

VJ JOINT EDITOR: ADDED ENTRY

1952   The prescription of CCC (1951) relating to the rendering of the names of joint editors in the heading of an editor-of-series entry was different from that in the heading of a book index entry. Faquir Chand proposed that a uniform practice should be followed in rendering the names of joint editors in all added entries (29).

VK PSEUDO SERIES

1950   B Guha expounded and illustrated the concept of "Pseudo Series" designed to meet the demands of multi-volumed books requiring independent classification and cataloguing (36).

1964   M M Job detected a conflict of rules relating to the rendering of the name of a pseudo series (53).

1966   The various difficulties in rendering the second section of a pseudo series index entry of kind 1 and 2 were demonstrated with a view to suggesting solutions to them (26).

VL COMPOSITE BOOK

1955   K D Puranik demonstrated the cataloguing of a composite book of complex nature according to CCC (1951) (96).

VM 'ORDINARY COMPOSITE BOOK': DEFINITION

1952   K D Puranik and S P Pharnis proposal an amend ment to the definition of the term 'Ordinary Composite Book' given in CCC in the light of their experience gained in regard to some new composite books (99).

VN ORDINARY COMPOSITE BOOK: CROSS-REFERENCE ENTRY

1964   S R Ranganathan and A Neelameghan made out a case for amending the rules for cross-reference entry for an ordinary composite book in CCC to bring it in line with that for an artificial composite book (178).

They found out further that provision should be made for a new kind of entry — Chain Cross-Reference Entry — for an Ordinary Composite Book (176).

VP PERIODICAL PUBLICATION

1967   S R Ranganathan and G Bhattacharyya distinguished the proceedings of periodical conferences, each volume of which has to mention the name of the place of the conference, as a new kind of complexity in periodical publications. To deal with this complexity, they suggested a set of amendments to the rules of CCC (1964) pertaining to periodical publications. This set of amendments has been accepted by CCC and will be incorporated in its Ed 6 (175).

1967   P C Tiwari demonstrated the helpfulness of giving the change-of-title note in the main entry, book index entries, and shelf list for a set of periodical publications with changed titles (210).

VQ UNION CATALOGUE OF PERIODICAL PUBLICATION

1950   In relation to the *Union catalogue of periodical publications in the libraries of South Asia*, S R Ranganathan explained the considerations that led to

1   The adoption of the bipartite form;

2   Making the classified part contain the main entries giving location;

3   Deviation from the *World list* in regard to abbreviation; and

4   Deviation from American and English practice in the notation to represent libraries (170).

VR Host Section and Documentation Work

1951   M L Nagar and S P Phadnis suggested amendments to the rules of CCC to suit documentation work (82). In the same year, they suggested also amendments to the rules of DCC to suit documentation work (83).

VS Recall Value

The latest concept with a considerable potency in the choice of entry word in a heading, just being developed by Ranganathan, is that of "Recall Value". This is described for the first time in Paper Q (the preceding paper) in the issue. It has led to a new canon for cataloguing — the Canon of Recall Value.

W Development of CCC

WI Development in General

Research in cataloguing in India has been contributing to the development of CCC from edition to edition. Besides the work, done by Ranganathan himself, the developmental research done by the members of the Library Research Circle (Delhi) has also contributed considerably to the improvement of some of the ideas incorporated in CCC. This Research Circle was formed on 2 September 1951 at the suggestion of Ranganathan (92). Its object was to work together as a team for tackling problems in Library Science. The significant contribution of the members of this Research Circle have been referred to in appropriate sections in this paper. This section is mainly concerned with the development of CCC, in general.

W2 Edition 2 (1945)

The original and the developmental features of CCC, Ed 1, have been referred to in Sec D. After the formulation of the Canons of Cataloguing in 1938, Scientific Method was applied in preparing Ed 2 of CCC. Other contributions of the *Theory* also helped in improving some of its rules. This edition incorporated:—

1   Chain Procedure as developed in the *Theory*;
2   Rules of alphabetisation as developed in *Theory*; and
3   Rules on Style of Writing so as to mechanise the work of alphabetisation (117).

W3 Edition 3 (1951)

In addition to its usual features, Ed 3 included rules for the preparation of entries for
1   Union catalogue of periodical publications; and
2   Abstracting periodical.

An English-Sanskrit glossary of cataloguing terms formed another additional feature of Ed 3. This glossary was arrived at during a series of discussion in morning walk, in Delhi, of Rananathan with his past and present students belonging to different linguistic groups. This was intended to form the basis for the formation of cognate terminology in the several Indian languages. This was tried out by the Hindi version of the Code with rules in Sanskrit Sutras (118).

W4 EDITION 4 (1958)

Ed 4 was a considerably developed and improved version. It was largely the result of the second round of the critical study of cataloguing problems embodied in the *Heading and canons* (1955). It sought to implement the layout for a catalogue code arrived at in that book. And therefore, the normative principles of cataloguing were made a part of the Code. It added the supplementary rules needed in the building up of a National Bibliography. It separated the problems of the determination of the authorship of a document, the choice of heading, and its rendering and prescribed the rules for them in independent chapters. It made some changes in the style of writing headings and the corresponding changes in the rules for alphabetisation. The corrections suggested in the *Heading and canons* were incorporated. This edition further eliminated the need for a separate Dictionary Catalogue Code. The necessary alternative rules for a Dictionary Catalogue Code were given in appropriate places in the Classified Catalogue Code itself. They were only a few (119).

W5 EDITION 5 (1964)

The inclusion of the discussions on the following topics is a distinctive feature of Ed 5:

1 Law of Symmetry;
2 Physical Form;
3 Centralised Cataloguing;
4 Homonym in Class Index Headings;
5 Feature Heading; and
6 Non-conventional Documents.

The rewording of several sections and the abolition of commentaries in several places are the other changes in Ed 5. A major change is the reorganisation of Parts and Chapters to make closer approximation to the Principle of Unity of Idea at the Part-level and the Chapter-level so as to form an experimental basis for the Indian Standards Institution draft of the standard for the presentation of ideas in a book (120).

W6 EDITION 6
Edition 6 of CCC is under preparation. Improvements
in the drafting of rules and specific indication of the rules to be
subjected to the Law of Local Variation will be the two distinctive
features of Ed 6. The rules already improved upon have been
given in a chapter in the *Cataloguing practice* (in press) (108).
They will be incorporated in Ed 6. One of the sources suggesting
the improvements is the comparative study of the different edi-
tions of CCC and ALA Code, initiated in 1964 by A R Desai and
now being continued by S R Ranganathan and G Bhattacharyya
(*See* Sec N3).

X Summary
X1 BLENDING OF DIFFERENT KINDS OF RESEARCH
The intellectual analysis of research into various kinds is
done only as a help to the understanding of the nature of research
work. Though intellectually separable, the different kinds of
research are not separated in actual practice. On the contrary,
they are blended at various stages and in different combinations.
This is a matter of judgment in each situation.

X2 RESEARCH PRIOR TO BEGINNING OF RESEARCH IN INDIA
Research in cataloguing prior to 1928 was done mostly
in UK, Germany, and USA. Among the pioneers in this field,
those, whose research work contributed substantially to the deve-
lopment of the subject "Cataloguing", were the following:
1 Henry   Baber; 2 Antonio   Genesio   Mario   Panizzi:
3 Charles   C Jewett;   4 Andrea   Crestadoro;   5 Karl
Dziatzko; 6 Charles A Cutter; 7 K A Linderfelt;   and
8 J Kaiser.
However, they had no fundamental laws of library science or
normative principles of cataloguing to guide their work. There-
fore, their research was hardly of the *a priori* variety. It had to
be mostly pragmatic and developmental. This pragmatic research
was observational as well as empirical. The observational
research included experiments, observations, surveys and other
similar acts. The empirical research took over the results of the
observational research and generalised from them certain prin-
ciples. The distinctive mental process involved in this form of
research was "Induction". The developmental research took
over from the pragmatic research and made finer adjustments
and improvements in the results already obtained, in order to
facilitate the achievement of immediate utility.

X3 FUNDAMENTAL LAWS OF LIBRARY SCIENCE
In 1928, S R Ranganathan enunciated the Five Laws of

Library Science. A dash of intuition revealed these fundamental laws to him. Transintellectual apprehension of fundamental laws through intuition is not taken to be research; it is beyond research. It is the ultimate starting point for deep *a priori* research. Thus, the Five Laws of Ranganathan provided the basis for deep *a priori* research in the different branches of library science including cataloguing.

X4 BEGINNING OF RESEARCH IN INDIA

Research in cataloguing in India had the benefit of being started as *a priori* due to the Five Laws of Library Science: and this was first carried out by S R Ranganathan himself. Unlike the pragmatic research carried out by his predecessors, the distinctive mental process involved in his *a priori* research was "Deduction" as against "Induction". This *a priori* research was pursued for immediate distinct utility of designing an efficient system of document finding. In this sense, the level of this research was that of applied research.

X5 BLENDING OF *A Priori* AND PRAGMATIC RESEARCH

The development of cataloguing in India is not attributable to the applied *a priori* research only. On the other hand, research in cataloguing in India has always been a blending of pragmatic research consisting of observational search and empirical research, and *a priori* research based on the Five Laws of Library Science and on the normative principles of cataloguing formulated in conformity to the Five Laws, so as to be immediately available as the basis for *a priori* research in cataloguing. For some years, Ranganathan could not get any companion in the pursuit of this research.

X6 INITIAL RESEARCH OF RANGANATHAN

The results of Ranganathan's initial researches in cataloguing got embodied in a few of his classical works. They are as follows:

1 Classified catalogue code (1934);
2 Theory of library catalogue (1938);
3 Dictionary catalogue code (1945); and
4 Library catalogue: Fundamentals and procedure (1950).

X7 FOLLOW-UP OF RANGANATHAN'S WORK

The work of Ranganathan upto 1950 was followed by a considerable amount of developmental research on the subject. This developmental research took over mostly from *a priori* research and made finer adjustments and improvements in the results already obtained to facilitate the achievement of immediate

utility. In this developmental research, besides Ranganathan, a considerable amount of contribution has been made by the members of the Library Research Circle (Delhi).

X8 ADVENT OF SCIENTIFIC METHOD

Research in cataloguing in India was taken to a further stage by the recognition and explicit statement of the steps in scientific method. Initially, the cycle of development was set up by the Five Laws of Library Science. Afterwards, the normative principles of cataloguing made this development directly amenable to the spiral of scientific method. This quality of "Cataloguing' as a subject fulfils the necessary condition of its being called a scientific discipline and not merely an *ad hoc* art. India is now fully aware of this fact.

X9 POTENTIALITY OF THE CANONS OF CATALOGUING

The set of Canons of Cataloguing is one of the outstanding contributions of India in the field of cataloguing. They are the specific normative principles applicable to cataloguing. The potentiality of these canons have not yet been fully exploited by the library profession. The establishment of DRTC (Documentation Research and Training Centre, Bangalore) in 1962 has provided an unexpected chance for the pursuit of research in cataloguing as in every other branch of library science including documentation. A section of the DRTC Research Team is actively pursuing the discipline of cataloguing. It is hoped that more such centres will take shape both in India and abroad.

Y Bibliographical References

Note.— 1 The following is the list of documents used.
   2 Column 1 gives the Serial Number of the respective documents.
   3 Column 2 gives the Number of Section in the text containing the reference.

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2 R8 ANANDA RAM (H N). Chain indexing: its significance. (Ind librarian. 14; 1959; 131–4).

3 P5 BALASUBRAMANYAN (S). Rendering of South Indian names appearing on the title-pages of works in Roman alphabet. (*In* Seminar on Rendering of Indic Names (Calcutta) (1960–1). Indic names. 1961. P 72–9).

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5   P8   BELSARE (V B). Maharashtrian names — their nature and problem in cataloguing. (Iaslic bul. 5; 1960; 74–7).

6   N3   BHATTACHARYYA (G). Principle of unity of idea in a catalogue code. (Lib sc. 5; 1968; Paper F).

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8   S2   —— and DATTA (S). Keyword indexing for the *Indian science abstracts*. (An lib sc doc. 14; 1967; 122–32).

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11   RS   CLEVERDON (C W). Report on the first stage of an investigation into comparative efficiency of indexing system. 1960. (Aslib Cranfield Research Projects. 1).

12   RS   ——. Report on the testing and analysis of an investigation into the comparative efficiency of indexing systems. 1962. (Aslib Cranfield Research Project. 1).

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16   RA   ——. Chain procedure applied to the Decimal Classification. (*In His* Subject catalogues. 1960. P 115–34).

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19   B35   CRESTADORO (Andrea). Art of making catalogue of libraries. 1856.

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22   B45   ——. ——. ——. ——. P 12.

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25   R5   DOUGHTY (D W). Chain procedure subject indexing
            and featuring a classified catalogue. (Lib Asso
            rec. 57; 1955; 173–8).

26   VK   DRTC COLLOQUIUM, LIBRARY SCIENCE (Series) (1966).
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27   B51   DZIATZKO (K). Instruktionen fur die ordnung der
            Titel im alphabetischen Zettelkatalag der Konig-
            lichen 1886.

28   R2   ELORD (J M). Classed catalogue in the fifties. (Lib
            resou tech serv. 5; 1961; 147).

29   VS   FAQUIR CHAND. Editor entry in *Classified cata-
            logue code*. (Bul, Ind Lib Asso. 2; 1952; B259).

30   B32   FRANCIS (F C). Reconsideration of the British
            Museum rules for compiling the catalogues of printed
            books—1. (*In* Piggott (Mary), *Ed*. Cataloguing
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31   Q4   GARDE (P K). Apropos of the last link index entry
            of the CC code. (Ind librarian. 2; 1947; 49–55).

32   V1   —— and PARTHASARATHY (S). Catalogue of asso-
            ciated books. (An, Ind Lib Asso. 1; 1950; 64–9).

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            choice for heading — case study about India.
            (Lib her. 4; 1961; 101–16).

35   VA   ——. Processing of NSS reports. (Lib her. 6;
            1964; 208–16).

36   VK   GUHA (B). Genesis of the concept of pseudo series.
            (An, Ind Lib Asso. 1; 1950; 168–72).

37   N5   —— and RAJAN (T N). Anglo-American cata-
            loguing rules with emphasis on rule 3 (works of
            shared authorship). (An lib sc doc. 14; 1967;
            143–51).

38   V5   GUNDU RAO (D). Category of joint authorship.
            (Her lib sc. 4; 1965; 242–3).

39   RM   ——. Style and rendering of feature headings derived
            by chain procedure in a printed frozen classified
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CC Number for Pakistan.
(Question and answer. 4) (*For* "*Question and answer.* 3" see
Page 191 *of this volume*)

1   Question
Muslim countries have been shown as follows:
        1(Q7) Muslim countries.
Contrary to the above example, number for 'Pakistan' has
been shown simply as
        44Q7 (Page 2·12 of CC ed 6) *instead of* 44(Q7)
Which is correct ?

11 ANSWER BY DRTC
        It is true that 1(Q7) represents Muslim countries in the
world. On this analogy 44(Q7) would represent only Muslim
countries in India, which is meaningless. At best we can inter-
pret it to mean Muslim Constituent States in India. This too is
without meaning. The digit-pair Q7 is added after 44 only as a
pseudo-mnemonic and not on the basis of subject device.
        The real fault is that "44Q7 Pakistan" implies that it is
a division of India, which it is not. This fault has been engaging
our attention from 1947 onwards. Our postulation of Emptying
Digit has now enabled us to get over this difficulty (*See* Ranga-
nathan (S R). Notational plane: Interpolation and extra-
polation. (An lib sc. 10; 1963; Paper A, Sec 24)).
        Pakistan is now represented by 44X. Here the digit X empties
the preceding digit 4 of its meaning and makes it semantically
empty. But the whole number 44X represents one of the countries
of Asia adjacent to India. We have now used this to represent
Pakistan. Similarly, we have used 44T to represent Nepal and
44V to represent Ceylon. (*See* Gopinath (M A) and Malhotra
(V K). Geographical schedule in CC, UDC, and DC. (Lib sc.
3; 1966; Paper K, Sec 30)).
        Before the device of Emptying Digit was postulated, geo-
graphical device had many anomalies. They have been
mocking at us from the very beginning. It has taken us forty
years to find a neat method of removing all those anomalies by
the postulation of Emptying Digits.