

**KAIKHUSHRU TARAPOREVALA MEMORIAL SERIES
IN LIBRARY SCIENCE**

No. 4

**ELEMENTS
of
LIBRARY CLASSIFICATION**

**Based on Lectures delivered at the University of
Bombay in December 1944**

BY

S. R. RANGANATHAN, M.A., L.T., F.L.A.
Librarian, Hindu, University Library, Benares.
Secretary, Madras Library Association,
President, Indian Library Association

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IN LIBRARY SCIENCE**

EDITED BY

P. M. JOSHI, M.A., Ph.D., (London),

Librarian, Bombay University Library.

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Member of the Imperial Library Council, Calcutta.

As General Editor of this Series I must thank my friend Mr. Phiroz Taraporevala for his help in making it possible. His brother the late Kaikhushru was keenly interested in a series of books in Librarianship and it is a fitting tribute to his memory that the present series is named after him.

P. M. JOSHI.

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GENERAL EDITOR'S PREFACE

I consider it an honour to include the name of Raosaheb S. R. Ranganathan among the writers of the Kaikhushru Taraporevala Memorial Series. In a sense the idea of starting this series was given to me by him. When I told him that the work done by him and the Madras Library Association in publishing his magnificent series of books on Library Science was an adequate expression of our Library consciousness, he differed from me. He said he desired that "books on Library Science, of all ranges, of all depths, of all standards, of all sizes and in all languages should flow incessantly from all parts of our Motherland."

Partly as a result of this conversation, I contemplated a series of primers on various aspects of Library Science and my friend Mr. Phiroz Taraporevala very willingly gave me his support and agreed to my suggestion that it should be named after his brother and my friend, the late Kaikhushru Taraporevals. Mr. S. V. Damle of the N. K. Publishing House, Poona also enthusiastically offered his co-operation in bringing out the Series. As its General Editor I must express my thanks to all these three friends for making the venture possible.

In December 1944 Raosaheb Ranganathan was invited by me to speak to the students of the Diploma Class in Librarianship conducted by the University of Bombay. He very readily agreed and gave a course of six lectures on Library Classification. The present book is based on these lectures. It is an admirable summary of all that the Raosaheb has thought and written on this problem and I have no doubt that it will prove an excellent introduction to the Science of Classification.

University Library,
Bombay, 1. }
3rd December, 1945.

P. M. JOSHI.

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CHAPTER 1

WHAT IS LIBRARY CLASSIFICATION ?

It is proposed to examine in this course of lectures the elements of Library Classification, These will be reached through concrete examples and experience. A logical approach to the fundamental principles will be found in the *Prolegomena to library classification*. An indirect and incidental contact with them can be had by perusing the *Library classification, fundamentals and procedure*. It is a practical handbook for those who seek gradual and graded training in Colon and Decimal Classifications. The *Prolegomena* is found by many to be too abstract. Indeed it presupposes much of prior classificatory experience. In the course given from year to year in the School of Librarianship of the University of Madras, my practice had been to reach the systematic study of that book only during the last of the three terms of the year. The *Fundamentals* is intended to help in the drill work to be done throughout the year. My practice had been to single out in each drill class just one or two canons of classification, that get illustrated in the exercises done in the day. In this process the principles of classification are brought to notice one by one in a casual way. It is therefore a long and tedious process. The principles get clinched and strung together only in the last term when the *Prolegomena* is studied systematically. I used to feel occasionally whether such a method was not too slow and diffuse.

There is next the question of technical terminology. This appears to induce a sense of revolt in some. But anybody should be prepared to concede that it is, on

the whole, beneficial for any special discipline to set up its own special terminology, rather than use the common terms. For, the associative quality of the latter unconsciously detracts from accurate and exact thinking. On the other hand if we settled and learned the special terminology of a subject as a preliminary step, we shall gain much in clarity and economy of thought at all later stages. All the classics of our ancients, be they scientific or humanistic, bear evidence of the implementing of this idea.

But the use of special terminology requires a persistent co-operation on the part of the learner or the reader and not infrequently a willingness to have special initiation in its use. In spite of this theory some librarians do want to be told the principles of library classification without recourse to special terminology. Oddly enough they insist on something simple which can be followed without effort and even without sufficient experience. No other profession in the world appears to ask for anything like this. If the library profession alone feels in this unprofessional way, that must be due to some faults in its attitude towards the what, why and how of library classification. Whether this conjecture be true or not, let us begin by considering the what, the why and the how as a means of facing the principles of classification.

Even more than technical terminology, the notation involved in library classification looks like a red rag in the eyes of some. Many a misconception has arisen in regard to the role of notation. Some make a fetish of it; while others would regard it as a non-essential auxiliary. This difficulty may be overcome if the foreground can be filled up in a non-notational manner. At any rate

I should like to try the experiment here in Bombay in the course of these lectures.

With these preliminary observations let me straight away plunge into the question "what is library classification?" I do not propose to spare any time for the history of the answer to this question. It is no doubt an interesting subject which deserves to be pursued; but we cannot find time for it in this short course. I shall therefore give abruptly what I believe to be the latest answer.

✓ Library classification is the translation of the name of the specific subject of a book into a preferred artificial language of ordinal numbers and the individualisation of the several books dealing with one and the same specific subject by means of another set of ordinal numbers which represent some features of the books other than their thought-content. The first of these ordinal numbers is called the Class Number of the book. The second ordinal number is called its Book Number. It is usual to separate the book number from the class number by a space or to write the former beneath the latter. The class number and the book number of a book taken together constitute its Call Number. The call number of a book fixes its position relatively to the other books in the library. ✓

The above answer has introduced three technical terms *viz.* Class Number, Book Number and Call Number. These constitute the notation in library classification. They are all ordinal numbers. There are no cardinal numbers corresponding with them. As I have already stated, we shall meet with them only towards the end of this course of lectures. Let not your mind get worried by them at this stage.

There is, however, another technical term in the above answer needing immediate attention. That is 'specific subject of a book'. Let us spend some time over it. The term "Subject of a book" is often used in a loose way. This popular use will hinder our thought and vitiate our reasoning. It is to avoid this contingency that we introduce the phrase "Specific Subject of a book". What do we mean by it? Let us begin with a few concrete examples.

Consider G. D. H. Cole's *People's front*, published in 1937. What is its subject? One may say vaguely 'British Labour' or even more vaguely 'Labour movement.' Some may put it down as belonging to 'British history' or merely 'History.' But 'History,' 'British history,' 'History of British political parties' and 'History of Labour Party in Great Britain' are all too wide of the mark. The specific subject of this book is strictly speaking 'History of the Labour Party in Great Britain brought up to 1930's'. If you can stand the jargon of logic, the above analysis is expressed as follows :

The last mentioned subject has exactly the same *extension* and *intension* as the content of the book ; whereas each of the other subjects mentioned above has a greater extension and smaller intension.

Take as a second example Elmer Edgar Stoll's *Shakespeare's young lovers*. Subjects like 'Literature', 'English literature', 'English drama', 'Shakespeare' and even 'Shakespearean criticism' are all too wide of the mark. They are all of greater extension and smaller intension than the contents of the book. Note in passing that the above subjects are arranged in descending order of extension and ascending order of intension. But

their sequence has not yet reached the exact specificity of the book. The only subject that does it is 'Criticism of Shakespeare from the point of view of the psychology of love'. The extension and intension of this subject coincide exactly with those of the content of the book. This subject is therefore the specific subject of the book.

One more example. Consider E. C. Baker's *Birds*. The title of this book does not bring out its specificity. It is not a general book on 'Birds'. Its field is more restricted. It does not deal with all problems connected with birds. It does not, for example, deal with their anatomy, physiology, pathology, ecology or embryology. It gives merely their natural history. Nor does the book deal with the birds in all the regions of the world. It is, on the other hand, confined to Indian birds. The subject 'Birds' is thus more extensive than the contents of the book in a two-fold way. Its specific subject, the subject whose extension and intension exactly register with those of the contents of the book, is 'Natural history of birds in India'.

Now we are in a position to be friendly with the technical term 'Specific Subject of a book'; we need not feel shy of its use. We can understand each other better and effect economy in exchanging thought if we include this term in our armoury of technical terminology. Let us, therefore, do so and clinch its definition as follows:

✓ The specific subject of a book is the division of knowledge whose extension and intension are equal to those of its thought-content. ✓

The next phrase in the definition of library classification which needs attention is 'Artificial language of ordinal numbers'. Language has been defined as the

sum total of the words and the way of using them prevalent in one or more countries. That is the ordinary meaning. Language is also used in the transferred sense of any method of expression—not merely expression through words. We speak, for example, of 'Finger language', 'Cipher language', 'Flower language' and so on. These are all artificial languages. The symbols and formulæ of chemistry form another artificial language designed to represent chemical action and relation in a most suggestive way. The symbols, and formulæ of mathematics form another powerful artificial language designed to mechanise the process of making valid inferences from given premises. Artificial languages are designed for specific purposes like secrecy, brevity, mechanisation of some thought processes and so on.

An artificial language of ordinal numbers is designed for the specific purpose of mechanising arrangement. When we have to seat a large gathering of people in a predetermined order, we mechanise their seating by having recourse to the use of ordinal numbers. I remember attending the opening of the Wembley Exhibition by King George V. The visitors were over a hundred thousand. Each one had been assigned an ordinal number in advance—shall I say, that the name of each one had been translated into an ordinal number. As we approached the stadium, we had to announce ourselves not as Ranganathan, Mazumdar and Joshi, but as 6.12.22, 6.14.7 and 6.16.40. (6.12.22 means seat number 22 in row number 12 of block number 6). The result was magical. The whole crowd of over a hundred thousand were shown to their seats and helped to settle down without any hitch whatever—with as much ease as if there were only one visitor and one seat in the whole.

stadium. Moreover in the middle of the function, Mazumdar was wanted by a friend waiting outside the stadium. A messenger who was an utter stranger to him looked into his dictionary which gave 6.14.7 as the synonym of Mazumdar and with the aid of this ordinal number, the messenger was able to pick out and take away Mazumdar from the stadium, quite unerringly and without any disturbance to anybody whatsoever. Is it inhuman to give up the proper name of a person and make him an ordinal number? Natural name, do you say, and artificial number! But really is there anything natural in names, proper or common? I am reminded of a Tamil cook who was annoyed at an English guest calling a certain thing 'potato'. "Why potato", he asked, "when you know that it is *Urulaikizhangi* (Tamil name)?" It is seldom that any of us can be called by one and the same appellation in all situations. One is addressed as 'Daddy' at home, 'Librarian' in the library, 'Secretary' in the Association and so on. The term used to denote one has to be functional; it has to vary with the function in the given context. When the function is for a friend of Dr. Joshi to single him out in a conversation, he is addressed as 'Dr. Joshi'. When the function is for the Vice-chancellor to call upon Dr. Joshi to answer an interpellation in the Academic Council, he is named 'Librarian'. When the function was for the volunteer at Wembley to take Dr. Joshi to his seat in the stadium, Dr. Joshi had to announce himself not as Dr. Joshi but as the ordinal number 6.16.40—Dr. Joshi reduced to a mere number! Yes, correctly so and without any offence to Dr. Joshi, in that situation and for that purpose. Similarly when Mazumdar's friend appeared at the gates of the Wembley stadium, the messenger had to reduce Mazumdar to a mere

number before he could pick him out! The logical French reduce prospective bus passengers in Paris to mere ordinal numbers as they collect at bus stops. When the bus appears, the conductor shouts the numbers serially so that each man enters the bus in his proper turn.

✓ In all such cases the desired order is fixed on some suitable principle and then mechanised by means of ordinal numbers. ✓ It was Melvil Dewey who first popularised the application of this device to the arrangement of specific subjects. He is therefore rightly referred to as the father of modern library classification. Library classification means reducing specific subjects and particular books to ordinal numbers for a specific purpose. The specific purpose is as follows: When a reader calls for a book, it must be located immediately though the library may have miles of books. When a book is returned to the library, its correct place in the shelves must be determined instantaneously. When a new book is added to the library, it must be found its proper place amidst the other books on the same specific subject. When the first book on a new specific subject arrives in the library, this new specific subject must be accommodated amidst such of the already existing specific subjects as are related to it and in the degree of its relation to them. ✓

Think over the following technical terms we have introduced in this lecture and read about them:—

1. Extension. 2. Intension. 3. Specific subject.
4. Class number. 5. Book number. 6. Call number.

CHAPTER 2

WHY LIBRARY CLASSIFICATION?

✓ We can see the wisdom of translating names of specific subjects into an artificial language of ordinal numbers if we realise the purpose of library classification. What then is the purpose? It is to arrange books in a helpful order—rather to mechanise the arrangement of books in a helpful order. It also helps to mechanise the correct replacing of books returned after use. It helps again to fix the most helpful place for a newly added book among those that already exist in the library. ✓

What is helpful order for books? I need not waste your time by examining trivialities like arrangement by colour, size or typography. The quality of books that determine their helpful order in a library is not any of these physical qualities.

✓ A common method of arranging books is by the names of their authors. This order will no doubt be helpful to a reader who wants the books by a particular author. ✓ But the experience in libraries shows that more readers ask for books on a particular subject rather than for books by a particular author. It thus follows that it is the specific subject of books that should determine their helpful order. This is the import of the First Law of Library Science, *viz.* Books are for use—as embodied thought and not as physical commodities, not even as productions of particular individuals, except in the case of classics and literature. ✓

When a reader asks for light on a specific subject, the arrangement in the library will be helpful to him only if all the books on that specific subject stand to-

gether. Further he will be better helped if they stand sorted out by their languages and if those in any linguistic group stand in order of their dates of publication, the latest books standing together at the very end of the set. This is one import of the Second Law of Library Science, *viz.* Every reader his book.

The second law would lead to another result also ; for, few readers are able to name their specific subjects exactly. It is a broader or a narrower subject that is usually thought of. Suppose that a reader asks for material on Public Finance. It is not sufficient if all the books on this specific subject are kept together. It is not improbable that his wants are really more specialised than what he expressed and that the exact focus of his interest was a subdivision of Public Finance, like Budget, Taxation, Land-Tax, Income-Tax, Death-duty, Public Debt and so on. He will therefore be better helped if the books on these specific subjects follow closely after those on Public Finance. Thus the Second Law would require that the specific subjects themselves should be arranged according to their degree of relation. The shelf arrangement should in other words display the full field of his interest, expressed as well as unexpressed. When he walks alongside the shelves of the library, he should find all that he was vaguely conscious of having wanted ; and indeed it is only then that he will be able to know the exact thing he wanted. It is only then that he will be delighted. This delight will be at bottom due to the satisfaction of unexpressed wants and to the getting of something which he did not know how to ask for. This represents a deeper function to be performed by the arrangement of books in a library.

Books too are anxious to find their readers. Their destiny, they hold, is the hands of readers. They want therefore that they should be so arranged that the probability for getting their readers is at its highest. This will be so if specific subjects are arranged among themselves in the degree of their mutual relation. Let me illustrate. A book on 'Soil' is likely to find its reader not only from those who are soil-specialists but also from among those who come for a general book on agriculture or for a book on manure. We shall therefore increase the chance for its finding its readers, if the specific subject 'Soil' is placed between the specific subjects 'Agriculture (general)' and 'Manure'. Similarly the helpful place for the specific subject 'Ploughing' is after 'Soil' and before 'Manure'. So also 'Planking' comes best after 'Ploughing' and before 'Manuring'.

This is the import of the Third Law of Library Science *viz.* Every book its reader. This law joins hands with the Second Law in demanding that specific subjects should be arranged according to their degree of mutual relation or affinity. We shall use the term *Filiatory Order* to denote an arrangement in the measure of affinity.

The Fourth Law of Library Science, *viz.* Save the time of the reader, also suggests the same conclusion as the above. In fact all the first four laws of Library Science turn our thought on specific subjects of books and on a reasonably filiatory arrangement of them. A further want is that the books on a given specific subject should themselves be arranged first by their languages and then by their years of publication.

A little thought will show that an alphabetical arrangement of specific subjects by their names, will not throw them in a filiatory order. It is quite easy to demonstrate this statement. Alphabetical arrangement will, for example, give the following order : Agriculture, Algebra, Apples, Arithmetic, Asparagus and Astronomy. Surely this is far from being filiatory or helpful. Anybody can see that the Laws of Library Science will require these specific subjects to be arranged in the following helpful order ; Arithmetic, Algebra, Astronomy ; Agriculture, Asparagus and Apples.

Indeed the phrase, ' Alphabetical Scattering ' clinches the substance of the above statement and rules out alphabetisation as a means of arranging specific subjects in a helpful order.

The few examples that I have cited show that there is a certain order among given specific subjects which will be helpful to readers. This preferred order is usually one among millions of possible orders. For example, the ten main classes of the Decimal Classification can be arranged among themselves in 3,628,800, different orders. Therefore it would be difficult to determine from the beginning, every time, the affinities of different specific subjects and fix the order of their arrangement in an ever consistent way. Not only would this take far too much time (thus violating the corollary ' Save the time of the staff ' implied in the Fourth Law), but it would also be difficult even for one person to be consistent with himself and still more so for different persons among themselves. Moreover, books that embody the various specific subjects must, from time to time, be replaced in proper order on the shelves. It would be uneconomical to require for this job a person

of sufficient ability to find out quickly their respective specific subjects and determine their filiatory order. On the contrary, it must be possible to entrust this work to persons of very ordinary ability. This can be done only if the arrangement can be mechanised. For this purpose names of specific subjects should be translated into such ordinal numbers as will throw the specific subjects in the preferred helpful or filiatory order.

In the course of this lecture, we have introduced two concepts *viz.* Helpful Order and Filiatory Order. Henry Evelyn Bliss denotes the latter by the phrase 'Collocation' of specific subjects. Read about these concepts in Bliss's *Organisation of knowledge* and *Organisation of knowledge in libraries* and in my *Prolegomena*.

CHAPTER 3

APPROACH TO LIBRARY CLASSIFICATION

For convenience we shall call 'classificationist' a person who devises a scheme of classification and 'classifier' a person who constructs the class numbers of specific subjects in accordance with a preferred scheme. The twelfth volume of the publication series of the Madras Library Association entitled *Library classification; Fundamentals and procedure* is largely concerned with the *how* of the classifier's work. I shall deal in this course with the *how* of the work of the classificationist. I should like to take you in a very concrete way through the thought process of a classificationist. To do this in the shortest possible time, I solicit your cooperation in a special way. Roneo copies of certain exercises will be distributed for work overnight. If these are looked into in advance, it will be possible for

us to make a rapid progress and eliminate wastage due to blackboard work and dictation, in the hours set apart for formal meeting. Moreover, your independent work on the exercises before meeting in the lecture hall would have made you intimate with the problems to be considered. It is also likely that you will not all arrive at the same solution. In the lecture room you will therefore have to defend your own solution against those of the others. It is this discussion which is necessary to discover and agree upon the fundamental principles, which should guide us in arriving at the most useful order among specific subjects, and in determining the most appropriate ordinal numbers to represent them.

The first Roneo script that is distributed to you contains an alphabetical list of 108 specific subjects. I am sure you will all agree with the heading, chosen for the list, *viz.* 'Unhelpful Alphabetical Order'.

Unhelpful Alphabetical Order

- | | |
|--|---|
| 1. Agriculture | 10. Anatomy of intestines (human) |
| 2. Analytical geometry | 11. Animal husbandry |
| 3. Analytical geometry of cubic curves | 12. Avoidance in British law of contracts |
| 4. Analytical geometry of cubic surfaces | 13. Avoidance in British law of partnership |
| 5. Analytical geometry of quadric curves | 14. Avoidance in Indian law of contracts |
| 6. Analytical geometry of quadric surfaces | 15. Avoidance in Indian law of partnership |
| 7. Anatomy (human) | 16. Behaviourism |
| 8. Anatomy of digestive system (human) | 17. Bibliography of geography |
| 9. Anatomy of flowering plants | |

18. Botany
19. Breeding of horses
20. British law
21. British law of contracts
22. British law of partnership
23. Chemical technology
24. Chemical technology of common salt
25. Chemical technology of salts
26. Christian law
27. Cold storage of potatoes
28. Criticism of Hamlet
29. Criticism of John Marston
30. Criticism of Shakespeare
31. Current electricity
32. Curriculum
33. Digestive system (human)
34. Economics
35. Education
36. Educational psychology
37. Electricity
38. Elementary education
39. English drama
40. English literature
41. Epistemology
42. Exemption from law on income from government bonds
43. Exemption from stamp duty
44. Exemption from stamp duty in Bombay
45. Exemption from stamp duty in Bombay, in 1940's
46. Field psychology
47. Flowering plants
48. Geography
49. Geometry
50. Geopolitics
51. Hamlet
52. Harvesting
53. Harvesting of potatoes
54. Hindu law
55. Horse husbandry
56. Hybridisation of horses
57. Income tax
58. Indian journal of geography (Begun in 1926)
59. Indian law
60. Indian law of contracts
61. Indian law of partnership
62. Indirect taxes
63. Insect infestation of crops
64. Insect infestation of potatoes
65. International Geographical Conference. (first conference 1850)
66. Intestines (human)
67. Jewish law

- | | |
|--|--|
| 68. Journal of the Royal Geographical Society. (founded in 1830) | 88. Political science |
| 69. Law. | 89. Potato crop |
| 70. Literature | 90. Potato farming |
| 71. Logic | 91. Psycho-analysis |
| 72. Manure | 92. Psychology |
| 73. Manure for potatoes | 93. Public finance |
| 74. Marston (John) (English dramatist born in 1575) | 94. Pure geometry |
| 75. Mathematical curriculum | 95. Pure geometry of cubic surfaces |
| 76. Mathematical curriculum for secondary schools | 96. Pure geometry of quadric surfaces |
| 77. Mathematics | 97. Scottish geographical magazine (begun in 1884) |
| 78. Medicine | 98. Secondary education |
| 79. Metaphysics | 99. Shakespeare (b. 1564) |
| 80. Muslim law | 100. Solid geometry |
| 81. Philosophy | 101. Solubility of common salt |
| 82. Physics | 102. Specific heat of common salt |
| 83. Physiology (human) | 103. Stamp duty |
| 84. Physiology of digestive system | 104. Storing of Agricultural produce |
| 85. Physiology of intestines | 105. Storing of potatoes |
| 86. Plane analytical geometry | 106. Tax on income from government bonds |
| 87. Plant anatomy | 107. Taxation |
| | 108. Weeding. |

Before we meet next time, try to sort out these 108 specific subjects into groups of related ones. I shall suggest one systematic method of doing so.

Begin 'Group 1' with the first specific subject in the Roneo-script *viz.* '1 Agriculture'. Run your eyes down the script and put into 'Group 1' every specific

subject which has affinity to Agriculture. As you include each specific subject in the group, strike out its name in the Roneo-script. I am sure you will agree that 'Group 1' will admit the following serial numbers: 1, 27, 52, 53, 63, 64, 72, 73, 89, 90, 104, 105 and 108. These should, therefore, be struck off from the Roneo-script.

Begin 'Group 2' with the first of the specific subjects that still survive unstruck in the Roneo-script; that is easily seen to be '2 Analytical geometry'. Then run your eyes down the surviving specific subjects in the Roneo-script and put into 'Group 2' every specific subject which has affinity to '2 Analytical geometry'. Here again as each specific subject is included in the group, strike it off in the Roneo-script. I am sure you will agree that 'Group 2' will admit the following serial numbers: 2, 3, 4, 5, 6, 49, 77, 86, 94, 95, 96, and 100. These should, therefore, be struck off from the Roneo-script.

Begin 'Group 3' with the first of the specific subjects that still survive unstruck in the Roneo-script; that is easily seen to be '7 Anatomy (human)'. Complete 'Group 3' in the prescribed manner and make up succeeding groups until all the 108 specific subjects of the Roneo-script are struck off *i. e.* assigned to a definite group.

Perhaps I may give a few more hints. If you come across a new term, find out its connotation by looking up a good dictionary, or encyclopædia or some other source. The current edition of Webster's *Dictionary* will be of great service in this matter. Perhaps 'Behaviourism' and 'Geopolitics' will need such attention in the case of some of you. Even in the case of apparently familiar terms, it may be wise to look up the dictionary if there is even the slightest doubt about its exact connotation.

CHAPTER 4

GROUPS OF RELATED SPECIFIC SUBJECTS

The grouping suggested in the last lecture has, I am sure, led to 15 groups. It will be a convenience if we can label each group in a suitable way. Obviously the label of a group ought to be the name of the Main Class of knowledge of which the specific subjects included in the group are Sub-classes. The label of 'Group 1' is 'Agriculture'; 'Group 2' has 'Mathematics' for its label; 'Medicine' suggests itself as the label appropriate to 'Group 3'; and so on.

I shall first enumerate the 15 groups arrived at by me with their respective labels. Then we shall take up each case in which there is difference of opinion about the grouping; for I do expect that there is little probability for all of us to have arrived at the same result. If there is the danger of such an improbable thing happening, I should ask some of you to improvise alternative groupings even now, so that we may be led to some helpful discussion. It is only by such a discussion that we can light upon the fundamental principles that lie at the bottom of our thought.

Here is the Roneo-script giving my grouping :—
Slightly Helpful Grouping with Unhelpful Alphabetical Order within each Group.

Group 1

Agriculture

- 1 Agriculture.
- 27 Cold storage of potatoes.
- 52 Harvesting.
- 53 Harvesting of potatoes.

- 63 Insect infestation of crops.
- 64 do. do. of potatoes.
- 72 Manure.
- 73 do. for potatoes.
- 89 Potato crop.
- 90 do. farming.
- 104 Storing of agricultural produce.
- 105 do. of potatoes.
- 108 Weeding.

Group 2*Mathematics*

- 2 Analytical geometry.
- 3 do. do. of cubic curves.
- 4 do. do. of cubic surfaces.
- 5 do. do. of quadric curves.
- 6 do. do. of quadric surfaces.
- 49 Geometry.
- 77 Mathematics.
- 86 Plane analytical geometry.
- 94 Pure geometry.
- 95 do. of cubic surfaces.
- 96 do. of quadric surfaces.
- 100 Solid geometry.

Group 3*Medicine*

- 7 Anatomy (human).
- 8 do. of digestive system.
- 10 do. of intestines.
- 33 Digestive system (human).
- 66 Intestines (human)
- 78 Medicine.
- 83 Physiology (human).
- 84 do. of digestive system.
- 85 do. of intestines.

Group 4*Botany*

- 9 Anatomy of flowering plants.
- 18 Botany.
- 47 Flowering plants.
- 87 Plant anatomy.

Group 5*Animal Husbandry*

- 11 Animal husbandry.
- 19 Breeding of horses.
- 55 Horse husbandry.
- 56 Hybridisation of horses.

Group 6*Law*

- 12 Avoidance in British law of contracts.
- 13 do. do. of partnership.
- 14 do. in Indian law of contracts.
- 15 do. do. of partnership.
- 20 British law.
- 21 do. of contracts.
- 22 do. of partnership.
- 26 Christian law.
- 54 Hindu law
- 59 Indian law
- 60 do. of contracts.
- 61 do. of partnership.
- 67 Jewish law.
- 69 Law.
- 80 Muslim law.

Group 7*Psychology*

- 16 Behaviourism.
- 36 Educational psychology.
- 46 Field psychology.
- 91 Psycho-analysis.
- 92 Psychology.

Group 8*Geography*

- 17 Bibliography of geography.
- 48 Geography.
- 58 Indian journal of geography (Begun in 1926).
- 65 International Geographical Conference (First conference 1850).
- 68 Journal of Royal Geographical Society (Begun in 1830).
- 97 Scottish geographical magazine (Begun in 1884).

Group 9*Chemical Technology*

- 23 Chemical technology.
- 24 do. of common salt.
- 25 do. of salts.
- 101 Solubility of common salt.
- 102 Specific heat of common salt.

Group 10*Literature*

- 28 Criticism of Hamlet
- 29 do. of John Marston.
- 30 do. of Shakespeare.

- 31 English drama
- 40 do literature.
- 51 Hamlet.
- 70 Literature.
- 74 Marston (John) (Eng. dramatist b. 1575).
- 99 Shakespeare (b. 1564).

Group 11*Physics*

- 31 Current electricity
- 37 Electricity
- 82 Physics

Group 12*Education*

- 32 Curriculum.
- 35 Education.
- 38 Elementary education.
- 75 Mathematical curriculum.
- 76 do. for secondary schools.
- 98 Secondary education.

Group 13*Economics*

- 34 Economics.
- 42 Exemption from tax on income from govt. bonds.
- 43 Exemption from stamp duty.
- 44 do. do. in Bombay.
- 45 do. do. do. in 1940's.
- 57 Income tax.
- 62 Indirect taxes.
- 93 Public finance.

- 103 Stamp duty.
- 106 Tax on income from govt. bonds.
- 107 Taxation.

Group 14

Philosophy

- 41 Epistemology.
- 71 Logic.
- 79 Metaphysics.
- 81 Philosophy.

Group 15

Political Science

- 50 Geopolitics.
- 88 Political science.

Let us now take each of the 15 groups in succession and discuss those specific subjects whose inclusion in the group is likely to raise any doubt regarding its appropriateness.

Group 1. *Agriculture*: I think there is no specific subject in this group which raises any difficulty. I think that no one will contend that 63 and 64 should really form another group with the label 'Zoology' because they involve 'Insects'. These two specific subjects involve both 'crops' and 'insects'. But it has to be realised that the main subject of study is 'crops' and that 'insects' come in only in a subordinated way in so far as they injure crops. If two main classes are involved in a specific subject, we must decide the primary one and group the specific subject with the primary main class involved.

Group 2. *Mathematics*: There can be no difference of opinion about any of the specific subjects included in this group.

Group 3. *Medicine*: No difficulty will be felt in regard to this group if the true connotation of the term 'Medicine' is remembered. It stands for the science of human body—its anatomy, physiology, diseases and growth; cure of diseases, surgery, pharmacognacy or the science of drugs, public health, hygiene,—everything in short concerning human body.

Group 4. *Botany*: There can be no difference of opinion about any of the specific subjects included in this group.

Group 5. *Animal husbandry*: 'Breeding' and 'Hybridisation' may make one think of 'Biology' as a more appropriate main class for them. But it has to be remembered that 'Biology' is by convention reserved for 'Methodology' and 'Pure science' while all cases of application to animals of economic value are again, by convention, included in 'Animal husbandry'.

Group 6. *Law*: There can be no difference of opinion about any of the specific subjects included in this group. I believe that no one contends that the law prevalent among a religious community or group should go into the group 'Religion' or 'Sociology'. For these laws are not studied either from the religious or the sociological point of view. The names of religions are brought in only to define a homogeneous group or community having a common legal system.

Group 7. *Psychology*: Perhaps the specific subject 'Educational psychology' needs some attention. We have to make sure what the primary subject of exposition is. Is it 'Psychology' or 'Education'? Surely, it is 'Psychology'. But what is the import of the epithet 'Educational'? It is merely to indicate that 'Psychology' is so expounded as to meet the special

requirements of 'Education'. The latter subject merely indicates the bias, so to speak, of the exposition of the former. Thus, it is more fitting that 'Educational psychology' should be grouped with 'Psychology' than with 'Education'.

Group 8. *Geography*: There is likely to be no difference of opinion about any of the specific subjects included in this group.

Group 9. *Chemical Technology*: The inclusion of 'Specific heat of common salt' into this group instead of the group 'Physics' needs attention. 'Specific heat' is a physical property of a substance. The main class 'Physics' is concerned with its definition and the methods of determining it appropriate to different states and classes of matter—matter as such and not differentiated matter or particular substances or commodities.

'Physics' deals only with the possession of properties by all matter and the methods of measuring them. The science that deals with the differing measures in which different commodities share a property is 'Chemical technology'.

Again, the inclusion of 'Solubility of common salt' into the group 'Chemical technology' instead of 'Chemistry' needs attention. 'Chemistry' is a pure science and is more concerned with processes and a general study of properties. The measure in which a particular chemical property is shared by a particular 'Commodity' or article of consumption is, by convention, taken with the applied science 'Chemical technology'. This is analogous to what has been said about 'Specific heat'.

Groups 10—14 call for no special remarks.

Group 15. *Political science* : The inclusion of 'Geopolitics' in this group needs attention. 'Geopolitics' is a newly developed subject which is concerned with the study of political relations and political science in so far as it is influenced by geographical conditions. Though two main classes *viz.* 'Political science' and 'Geography' are involved in it, the subject of exposition is primarily the former and 'Geography' comes in only as an influencing factor *i. e.* in a secondary way. It is therefore proper to include 'Geopolitics' in the group 'Political science'.

As a preparation for the next stage of discussion, re-arrange the specific subjects in each of the fifteen groups in what you regard as the most helpful order. It is likely that you do not all arrive at the same order for all the groups. Indeed it is difference of opinion among you that will help us to get an insight into the fundamental principles that decide 'Helpful order' and make classification elegant and useful in every way. W. C. Berwick Sayers was the first librarian to isolate such fundamental principles. He called them 'Canons of classification'. His latest exposition of them will be found in the recent second edition of his *Manual of classification*. The canons are derived to a fuller extent by a deductive process in my *Prolegomena*. In the next few lectures we shall derive them by an inductive process based on the 108 specific subjects we are now considering.

CHAPTER 5

HELPFUL ORDER WITHIN GROUPS

The basic canon of classification is the Canon of Helpful Order. Various are the principles that are used to determine the helpful order in which any two specific subjects should be arranged. These principles will emerge one by one as we proceed with the discussion of what constitutes 'Helpful order' among the specific subjects included in each of the 15 groups we have considered already. Alongside these principles will also emerge other Canons of Classification. I shall choose the groups for discussion in an order that is likely to help the emergence of these principles and canons in a convenient sequence and at a comfortable rate.

Principle of Decreasing Extension

Consider the specific subjects 'Group 11, Physics'. I have determined the helpful order to be

82 Physics, 37 Electricity,
31 Current electricity.

I find that some have preferred the order.

31 Current electricity, 37 Electricity,
82 Physics.

Let me say, at the outset, that both the orders are 'Filiatory'. But both are not equally helpful.

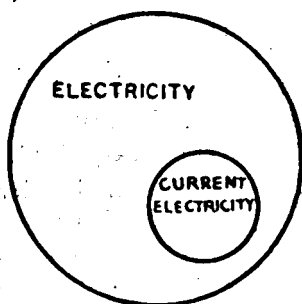
You can see that my preferred order is the reverse of what some have preferred. How to choose between these two? Are we to toss a coin and decide? Yes, we must do so, unless we can discover some rational principle to help us. Just see if you cannot agree that it will be more helpful to readers if they are first brought into contact with the general books on physics, then

with books on the successive branches of physics like electricity and still later with books on the successive divisions of electricity like current electricity rather than be first brought into contact with minute divisions of physics like current electricity, and statical electricity, then with books on branches like electricity and light and at long last with the general books on physics. In the former, the progress is from classes of greater extension and smaller intension to those of smaller extension and greater intension. It is this order that is found to be more helpful. We, therefore, enunciate the following :

Principle of Decreasing Extension

If one of two classes is of greater extension than the other and includes the other completely within itself, then that one must have precedence over the other.

Perhaps it may be helpful to visualise the principle by a diagram. If class A is represented by the bigger circle and class B by the smaller circle lying entirely within the bigger one, A must have precedence over B.

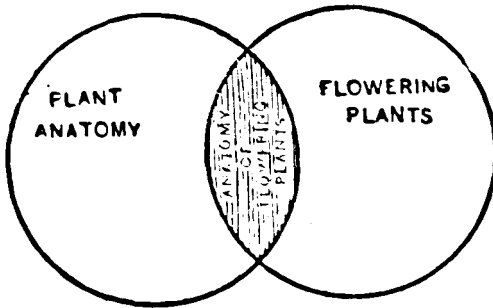


This principle is called Canon of Intension in the *Prolegomena*.

Principle of Increasing Concreteness

Consider the four specific subjects of 'Group 4; Botany'. By the Principle of Decreasing Extension we decide at once that '18 Botany' must occupy the first place. By the same principle and by consideration of affinity we further decide (a) that '47 Flowering plants' should have precedence over '9 Anatomy of flowering plants' and (b) that the two should move together *i. e.* we may pin the two specific subjects together, so to speak, and regard the pinned pair as a single entity for all further purposes and call it simply by the name 'Flowering plants'. Thus our problem is reduced to the determination of order of precedence between '87 Plant anatomy' and '47 Flowering plants'.

If we represent these two specific subjects diagrammatically, we do not get a circle within circle. The Principle of Decreasing Extension is, therefore, not applicable. The diagram that we get is a pair of over-



lapping circles. The circle representing 'Plant anatomy' includes not only anatomy of different plant-groups but also the abstract principles of plant anatomy and its methodology. But the circle representing 'Flowering

plants' is concerned solely with that particular plant-group. Thus, 'Flowering plants' is more concrete than 'Plant anatomy'. The latter should therefore have precedence over the former. It is this order that is found to be more helpful. We, therefore, enunciate the following :

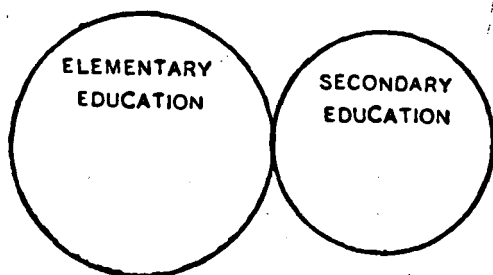
Principle of Increasing Concreteness

If two classes are of different degrees of concreteness, the less concrete (*i. e.* the more abstract) must have precedence over the other.

Principle of Evolutionary Order

Consider next the specific subjects of 'Group 12, Education'. The Principle of Decreasing Extension, (1) gives the first place to '35 Education', (2) puts '75 Mathematical curriculum' after '32 Curriculum' and pins them together, (3) puts '76 Mathematical curriculum for secondary schools' after '98 Secondary education' and pins them together.

We have, thus, to consider only three specific subjects virtually *viz.* '32 Curriculum', '38 Elementary education' and '98 Secondary education'. The Principle of Increasing Concreteness gives precedence to '32 Curriculum' over the other two. Thus the only



problem to be solved is the determination of order of precedence between '38 Elementary education' and '98 Secondary education'. If we represent them diagrammatically, we get neither a circle within circle nor two overlapping circles. We get only two non-intersecting circles. Thus none of the earlier principles is of help. However, we readily give precedence to 'Elementary education' on the ground that it belongs to an earlier stage of evolution. The resulting helpful order is :

35 Education,	38 Elementary education,
32 Curriculum,	98 Secondary education,
75 Mathematical curriculum,	76 Mathematical curriculum for secondary schools.

The new principle by which 'Elementary education' was given precedence over 'Secondary education' is the following :

Principle of Evolutionary Order

If two classes belong to different stages in the same line of evolution, the one at the earlier stage must have precedence over the other.

Principle of Chronological Order

Consider the specific subjects in 'Group 10, Literature'. The Principle of Decreasing Extension, (1) fixes '70 Literature' in the first place, (2) puts '74 Marston (John)' before '29 Criticism of John Marston', (3) leads to the order '99 Shakespeare', '51 Hamlet' and '28 Criticism of Hamlet', (4) puts '39 English drama' prior to the Shakespeare and Marston groups and (5) puts '40 English literature' prior to '39 English drama'. We have yet to find the helpful place to '30 Criticism of Shakespeare' among the specific subjects of the Shakespeare group. This is decided by the Principle of Evolutionary Order. The general Criticism of Shakes-

peare can evolve only after all his works are evolved. It therefore follows that '30 Criticism of Shakespeare' should come after '20 Criticism of Hamlet'. There is still one more problem awaiting solution. Should the Shakespeare group precede or succeed the Marston group? Shakespeare being the older of these two English dramatists, it is deemed helpful to give precedence to him. Thus, the helpful order arrived at is as follows :

70 Literature,	51 Hamlet,
40 English literature,	28 Criticism of Hamlet,
39 English drama,	30 Criticism of Shakespeare,
99 Shakespeare,	74 Marston,
	29 Criticism of Marston.

The new principle of arriving at helpful order we have used here is the following :

Principle of Chronological Order

If one of two classes belongs to an earlier point of time than the other, then that one must have precedence over the other.

Principle of Geographical Order

Consider the three provinces : Madras, Bombay, and the Punjab. It is certainly unhelpful to arrange them in the order, Madras, the Punjab and Bombay, as it ignores geographical contiguity. Either the order, Madras, Bombay and the Punjab, or the reverse of this will be more helpful. The choice between these two equally helpful orders has to be made arbitrarily.

The principle involved may be enunciated as follows :

Principle of Geographical Order

When a number of geographical areas, not lying within one another, are to be arranged, a helpful order

precedence to 'Contracts' as 'Partnership' is only a subclass of Contracts. Thus, this subgroup gets arranged as follows :

- | | |
|----------------------------|---|
| 59 Indian law, | 14 Avoidance in Indian law
of contracts, |
| 60 Indian law of contracts | 61 Indian law of partnership,
15 Avoidance in Indian law of partnership. |

Similarly we get the following order for the British group :

- | | |
|------------------------------|---|
| 20 British law, | 12 Avoidance in British law
of contracts, |
| 21 British law of contracts, | 22 British law of partnership,
13 Avoidance in British law of partnership. |

The next problem is to arrange the groups 'Indian law' and 'British law' among themselves. The Principle of Geographical order suggests itself. India and Great Britain are not contiguous areas ; we, therefore, decide to put them in the order in which their respective continents will be put. It is only convention that can decide the order among 'Asia' and 'Europe'. Let us assume that 'Asia' has precedence over 'Europe'. Then 'India' must have precedence over 'Great Britain'. It is, therefore, desirable to give precedence to 'Indian law' over 'British law' in the matter of shelf-arrangement. This desirability may be generalised into the following :

Canon of Consistent Order

When the same categories occur explicitly or implicitly in different places, they must be arranged in the same order in all the places.

We have still to arrange 26, 54, 67 and 80. These are the legal systems of different religious communities. By the Canon of Consistent Order they must be arranged in the same order as the religions themselves. The

Principle of Chronological Order would arrange the religions concerned in the following order.

Hinduism,	Christianity,
Judaism,	Muhammadanism.

Consistently with this we have the following order for the corresponding legal systems :

54 Hindu law,	26 Christian law,
67 Jewish law,	80 Muslim law.

In this set, the communities are arranged on the basis of religion. In the set '59 Indian law' and '20 British law', the communities are arranged on the basis of nationality or geographical area. How are we to decide order of precedence between these two sets? It is only the Principle of Canonical Order that can be of help. We shall then adopt the convention that legal systems of national or geographical groups must have precedence over those of religious and other groups. Then, the 15 specific subjects under consideration will fall in the following helpful order :

69 Law,	21 British law of contracts,
59 Indian law,	12 Avoidance in British law of contracts,
60 Indian law of contracts,	22 British law of partnership,
14 Avoidance in Indian law contracts,	13 Avoidance in British law of partnership,
61 Indian law of partnership,	54 Hindu law,
15 Avoidance in Indian law of partnership,	67 Jewish law,
20 British law,	26 Christian law,
	80 Muslim law.

Principle of Increasing Complexity

Consider 'Group 2, Mathematics'. Considerations of affinity will throw the 12 specific subjects into the following subgroups :

Subgroup 1

- 2 Analytical geometry, 49 Geometry,
 94 Pure geometry.

Subgroup 2

- 3 Analytical geometry 5 Analytical geometry of
 of cubic curves, quadric curves,
 86 Plane analytical geometry.

Subgroup 3

- 4 Analytical geometry 95 Pure geometry of cubic
 of cubic surfaces, surfaces,
 6 Analytical geometry of 96 Pure geometry of quad-
 quadric surfaces, ric surfaces,
 100 Solid geometry.

Consider 'Subgroup 1'. The Principle of Decreasing Extension would give the first place to '49 Geometry'. We proceed as follows to decide the order of precedence between the other two. They emphasise two different methods of study viz. Analytical and Purely geometrical. Here 'Analytical' really means 'Algebraic'; and 'Algebra' and 'Geometry' are canonical divisions of Mathematics and their canonical order is: Algebra, Geometry.

Thus by applying the Canon of Consistent Order, we get the following helpful order for 'Subgroup 1'.

- 49 Geometry, 2 Analytical geometry,
 94 Pure geometry.

Consider 'Subgroup 2'. The Principle of Decreasing Extension promotes '86 Plane analytical geometry' to the first place. To decide the order of precedence between the other two specific subjects, we argue as follows.: 5 deals with 'Quadric' or 'Second degree' curves which are less complex and more simple than

the 'Cubic' or 'Third degree' curves with which 3 deals. There are for example only 6 species of quadrics against 72 of cubics. It is therefore more helpful to put 5 before 3. This principle may be enunciated in the following form :

Principle of Increasing Complexity

If one of two related classes involves or deals with smaller complexity than the other, then that one must have precedence over the other.

Consider 'Subgroup 3'. The arguments used for 'Subgroup 1' and 'Subgroup 2' are all applicable to this ; and we get the following helpful order ;

100 Solid geometry

4 Analytical geometry of quadric surfaces

96 Pure geometry of quadric surfaces,

3 Analytical geometry of cubic surfaces

95 Pure geometry of cubic surfaces.

The idea is that everything on 'Quadric surfaces' should come together and so also everything on 'Cubic surfaces' should come together, whether they are studied by analytical or by pure methods.

We have next to arrange the three subgroups among themselves. The Principle of Decreasing Extension would give the first place to 'Subgroup 1' while the Principle of Increasing Complexity will give precedence to 'Subgroup 2', as it deals with planes or two dimensional space whereas 'Subgroup 3' is concerned with solids or three dimensional space which is more complex.

Thus the helpful order for the specific subjects of 'Group 2, Mathematics' is determined as follows :

- 77 Mathematics
- 49 Geometry
 - 2 Analytical geometry
- 94 Pure geometry
- 86 Plane analytical geometry
 - 5 Analytical geometry of quadric curves
 - 3 Analytical geometry of cubic curves
- 100 Solid geometry
 - 6 Analytical geometry of quadric surfaces
- 96 Pure geometry of quadric surfaces
 - 4 Analytical geometry of cubic surfaces
- 95 Pure geometry of cubic surfaces.

We have, by now, contacted most of the special principles which will be of use in determining Helpful Order. Let us, therefore, deal rapidly with the remaining eight groups of specific subjects.

Group 1. Agriculture

The Principle of Increasing Concreteness will, in the first instance, separate the 13 specific subjects into two groups: those relating to General Agriculture and those relating to Potato. The Principle of Decreasing Extension will give precedence to the former group. In either group, the Principle of Chronological Order will determine the following helpful order without any difficulty:

- 1 Agriculture
- 72 Manure
- 63 Insect infestation of crops
- 108 Weeding
- 52 Harvesting
- 104 Storing of agricultural produce
- 90 Potato farming

- 73 Manure for potatoes
- 64 Insect infestation of potatoes
- 53 Harvesting of potatoes
- 89 Potato bulbs
- 105 Storing of potatoes
- 27 Cold storage of potatoes.

The precedence of 'Storing of potatoes' over 'Cold storage of potatoes' is demanded by the Principle of Decreasing Extension. I find that some have put '108 Weeding' before '63 Insect infestation of crops'. They should realise that the incidence of insect infestation may happen even immediately after the sowing of seeds or transplantation of seedlings; but weeds will have to grow for some time before weeding can begin. That is why we give a later place to '108 Weeding'.

Group 3. Medicine

The Principle of Decreasing Extension will, in the first instance, separate the 9 specific subjects into three groups of three each: (1) those relating to the whole human body; (2) those relating to the digestive system; and (3) those relating to the intestines. The same principle also singles out easily the first in each group. To fix the order among the other two, we have to invoke the aid of the Principle of Chronological Order and say that the structure of the organs is prior to their functioning and that, therefore, 'Anatomy' must have precedence over 'Physiology' in each of the three groups. Thus we arrive at the following helpful order:

- 78 Medicine
- 7 Anatomy
- 83 Physiology
- 33 Digestive system

- 8 Anatomy of digestive system
- 84 Physiology of digestive system
- 66 Intestines
- 10 Anatomy of intestines
- 85 Physiology of intestines.
- [Some offer the following alternative order :
- 78 Medicine
- 33 Digestive system
- 66 Intestines
- 7 Anatomy
- 8 Anatomy of digestive system
- 10 Anatomy of intestines
- 83 Physiology
- 84 Physiology of digestive system
- 85 Physiology of intestines].

None of the principles we have contacted so far will help us to determine which of the above two orders is more helpful. In a situation like this, we have to go behind these derived principles and appeal to the fundamental Laws of Library Science themselves. These laws will, in their turn, ask us to observe the users of books on medicine and find out whether specialisation in medicine goes by organs or by problems. I think the prevalence of specialists like Dentists, Nose specialists, Heart specialists, Ophthalmologists, Orthopaedists and Dermatologists would lead one to vote in favour of specialisation by organs. If this is the correct view, the first alternative is more helpful than the second.

Occasions for appealing to fundamental laws will only be few and far between. It will be wasteful to appeal to them in every case. These fundamental laws have to show the way in all matters connected with a library like book selection, accession, classification,

cataloguing, shelf-arrangement, shelf-guiding, issue-method, reference service, and so on. To meet the special problems connected with any one of these, it is convenient to derive from the Five Laws of Library Science special principles shaped to solve them expeditiously and exactly. This is like deriving from iron special tools to suit special jobs. When a novel job outwits all the existing tools, we go back to iron itself and improvise a temporary tool for the occasion. So also when the determination of helpful order among a set of specific subjects outwits the seven special principles we have derived from the Laws of Library Science to deal readily with problems in classification, we make a direct appeal to the Laws themselves and arrive at a decision. Otherwise we do not go to the Five Laws. Once they have yielded the special principles needed for the solution of different groups of problems in library work, they are allowed to rest in peace. They will be disturbed only when an unusual situation arises baffling the derived principles.

You find an analogy in political organisation. The supreme governing body, the legislature, is not invoked at every turn. It creates the executive, the judiciary and the administration; it also puts several laws on the statute book; then it rests. Normal work in the nation is done by its creatures. Whenever an abnormal situation transcending their capacity arises, the legislature is disturbed from its rest and a solution is sought directly from it.

This pattern of behaviour is, indeed, universal. It is allegorised in the Indian *Puranas*. In them the Supreme Lord of the universe is pictured as sleeping on a banyan leaf which is floating amidst the high seas of milk.

Is it because He is callous about the universe? No. He is able to sleep like that as He has provided for most of the contingencies likely to arise in the development of the universe. He has delegated powers to Brahma, Indra and so on. He has delegated powers even to you and me to meet with situations that exclusively concern us. If mosquitoes bite us, we exercise our delegated power and try to exterminate them and in the meantime protect ourselves with curtains. We do not invoke the direct action of the Supreme Lord. But once in a way a situation arises baffling not only our own individual power and capacity but that of even Indra and Brahma. Then the Supreme Lord has no objection to be disturbed from his eternal sleep on the leafy float. The opening verses of the *Bhagavata-purana* describe one such scene. All the rishis, the devas and the earth itself approach Brahma for redress. He too feels baffled. And so, with him as leader, all approach the shores of the milky ocean and cry out for the distant Lord. But they are surprised to find that He answers their call from their immediate vicinity. They are surprised. The Lord says, "Don't think that I am sleeping. I don't interfere so that you may become self-dependent. But I am never oblivious. I am ever aware. I am ever ready to pull you through really difficult situations which transcend your capacity".

The Helpful Order of the specific subjects of the remaining five groups is said to be as follows. Justify the same with the aid of the principles arrived at so far.

Group 5. Animal Husbandry

11 Animal husbandry

55 Horse husbandry

- 19 Breeding of horses
- 56 Hybridisation of horses.

Group 8. Geography

- 48 Geography,
- 17 Bibliography of geography,
- 58 Indian journal of geography (Begun in 1926),
- 68 Journal of the Royal Geographical Society
(Founded in 1830),
- 97 Scottish geographical magazine (Begun in 1884),
- 65 International Geographical Conference (First
Conference 1850).

Group 9. Chemical Technology

- 23 Chemical technology
- 25 Chemical technology of salts
- 24 Chemical technology of common salt
- 102 Specific heat of common salt
- 101 Solubility of common salt.

Group 13. Economics

- 34 Economics
- 93 Public finance
- 107 Taxation
- 57 Income tax
- 106 Tax on income from Govt. bonds
- 42 Exemption from tax on income from Govt.
bonds
- 62 Indirect taxes
- 103 Stamp duty
- 43 Exemption from stamp duty
- 44 Exemption from stamp duty in Bombay
- 45 Exemption from stamp duty in Bombay in 1940's.

Group 15. Political Science

88 Political science

50 Geopolitics.

Look up the Canon of Helpful Order and the Canon of Consistent Order and the associated principles in the *Prolegomena* and locate and read corresponding information in the books of Bliss and of Sayers.

Also work out the helpful order for the 15 main classes into which the 108 specific subjects had been divided. Find out also the order in which they are thrown in the Colon Classification and in the Decimal Classification.

We shall next take each of the 15 groups in succession, with the specific subjects arranged in helpful order, translate the names of the specific subjects into their Decimal Numbers and observe whether the preferred order is preserved by the Decimal Numbers or changed. If they are changed we shall examine if the change is for the better or the worse. We shall also be on the look-out for other experiences. In this process we shall contact many more fundamental ideas and canons of classification. We shall also translate the names of the specific subjects into Colon Numbers and study the result in the same way as in the case of Decimal Numbers.

Those of you who are ambitious may with the aid of the *Fundamentals* and the *Decimal classification* and the *Colon classification* respectively practise constructing the Decimal Numbers and the Colon Numbers.

CHAPTER 6

CANONS OF CLASSIFICATION

We have so far contacted only two canons of classification *viz.* Canon of Helpful Order and Canon of Consistent Order. More will emerge as we translate the names of specific subjects into Class Numbers. We shall now take the Decimal and the Colon Numbers of the specific subjects in each group in succession and discuss them so as to bring as many canons as possible to light.

Group 11. Physics

The following table gives the translations :

Dec. No.	Sp. subjects	Col. No.
53	Physics	C
537	Electricity	C 6
537.5	Current electricity	C 62

Both the schemes preserve the order we had preferred.

Now look up the *Decimal classification* for the meaning of 537.5. It is given as 'Dynamic'. This is an adjective. How do we take the number 537.5 to stand for 'Dynamic electricity'? By looking a few lines higher up, we find that 537 is translated as 'Electricity'. From this we infer that the adjective 'Dynamic' is to be completed by the addition of the noun 'Electricity'. In actuality, however, this noun is omitted against 537.5 and taken as understood. This practice of omitting words on the part of the classificationist and of mentally supplying the omitted word on the part of the classifier does lead to economy in the construction of the schedules of classification. This practice is governed by the following :

Canon of Context

If the term entered in the schedule against a class number is by itself incomplete in meaning or is capable of more than one meaning, the correct and complete meaning is to be had by referring to the term that occurs in the same schedule against the class number of which the class number originally considered is a sub-division.

Now look up the *Colon classification* for the meaning of C 62. We have to construct the meaning by combining the meaning of C 6 (= Electricity) and of 2 (= Current electricity). Here it can be seen that it would have been sufficient if 2 had been given the meaning 'Current' only, as the term 'Electricity' is obtainable by the Canon of Context. Thus the Colon Classification has failed to effect the economy in words warranted by that Canon. This is a fault which could have been easily avoided.

Going back to the *Decimal classification* for a moment, we find that it uses the term 'Dynamic electricity' whereas the term that is now current to denote it is 'Current electricity'. In this the Decimal Classification is said to violate the following :

Canon of Currency

The terms used in the schedules of a scheme of classification should be those in actual currency among those who deal with the subject.

The Colon Classification has respected this canon in regard to the subject under consideration.

Group 14. Philosophy

The following table gives the Colon translation :

Col. No.	Sp. subject
R	Philosophy
R 1	Logic
R 2	Epistemology
R 3	Metaphysics.

The Colon Classification thus preserves the order we had preferred. There is no peculiarity in the use of the terms used.

The following table gives the Decimal translation, with the specific subjects re-arranged in the order in which the Decimal Classification would have them :

Dec. No.	Sp. subject
1	Philosophy
11	Metaphysics
121	Epistemology
16	Logic.

It may be stated that this arrangement violates the Canon of Helpful Order. This canon is violated by many other subdivisions of the class 'Philosophy' in the Decimal Classification. It would be a good exercise to make a list of such violations.

Group 4. Botany

The following table gives the Decimal translation :

Dec. No.	Sp. subject
58	Botany,
581.4	Plant anatomy,
582	{ Flowering plants, { Anatomy of flowering plants.

So far as the first three specific subjects go, the Decimal Classification preserves the order we had preferred. But the name 'Anatomy of flowering plants' is translated into the same as the name 'Flowering plants'. This is a fault. The four specific subjects form a chain of specific subjects with decreasing extension. The Decimal Language is hospitable enough to provide a separate Decimal Number to accommodate each of the first three links of this chain. But it is not able to do so for the fourth link, which is, therefore, obliged to share the same number or accommodation as its immediate universe *viz.* 'Flowering plants'. This fault is described in technical terminology, as violation of the Canon of Hospitality in Chain.

The following table gives the Colon translation :

Col. No.	Sp. subject
I	Botany,
I : 2	Plant anatomy,
I 5	Flowering plants,
I 5 : 2	Anatomy of flowering plants.

The Colon Classification satisfies the Canon of Hospitality in Chain in this case and, also preserves the order we had preferred.

The following may be given as the definition of the

Canon of Hospitality in Chain :

The notation of a scheme of classification must be such that as a class gets subdivided further and further the resulting sub-classes in the chain get each a distinctive class number, so that these class numbers preserve their proper filiatory order.

Group 12. Education

The following table gives the Decimal translation :

Dec. No.	Sp. subject
37	Education,
372	Elementary education,
373	Secondary education,
375	Curriculum,
375.51 C	Mathematical curriculum,
?	Mathematical curriculum for secondary schools.

In the first place, the Decimal has rearranged the classes, the chief disorder being the insertion of 'Elementary education' and 'Secondary education' between 'Education' which is general and 'Curriculum' which concerns general education. Filiatory order requires that nothing should separate 'General education' from anything that concerns it. If anything separates them, the Canon of Helpful Order is violated.

Secondly, 'Mathematical Curriculum for secondary schools' is left in an unenviable position. It is like the ass between two equally distant haystacks starving itself to death as it could not choose between them. The trouble is traceable to the co-ordinate classes '373 Secondary education' and '375 Curriculum' not being mutually exclusive. A subject like 'Curriculum for secondary schools' has a right to be in both of those two classes, unless it be given a distinctive place of its own. This phenomenon is described as the violation of the following :

Canon of Exclusiveness

The co-ordinate classes of a universe should be mutually exclusive.

This phenomenon will cause much confusion and inconsistency in actual practice. It is, therefore, expunged by prescribing a forced preference to put such a disturbing new class definitely and consistently into one of the two possible classes. In this case, the forced convention is to put it in '373 Secondary education'.

This convention still violates, it must be noted, the Canon of Hospitality in Chain.

The following table gives the Colon translation :

Col. No.	Sp. subject
T	Education,
T : 44	Curriculum,
T : 44 : B	Mathematical Curriculum,
T 15	Elementary education,
T 2	Secondary education,
T 2 : 44 : B	Mathematical Curriculum for Secondary Schools.

The Colon Classification preserves the order already preferred by us. It satisfies the Canon of Hospitality in Chain and avoids playing itself into the horns of the Canon of Exclusiveness.

The great difference between the ways in which the Decimal and the Colon Classifications translate the names of the six specific subjects of 'Group 12. Education' is not a mere chance. It will be seen to persist everywhere systematically. It is due to a fundamental difference in the ways in which the two schemes build up their numbers. Let us take a closer view of it.

Education may be divided on the basis of the stage or class of persons educated. Then it will yield classes like

Elementary, Secondary, University, Adult and so on. It can also be divided on the basis of the problem considered. Then it will yield classes like Teaching technique, Organisation, Curriculum, Hygiene and so on.

These two sets of classes are derived from 'Education' which is the *universe* being classified, on the basis of two different qualities or *characteristics* of it *viz.* Educand and Problem respectively. Further the first set of classes, which share the same Educand Characteristic in different measures and are therefore co-ordinate with one another, are said to form an *Array* of classes. Similarly the second set of classes form another Array and are based on another characteristic *viz.* Problem Characteristic. Each of these two arrays is homogeneous. To secure homogeneity among the classes of an array, all its classes must be derived from the universe on the basis of one and the same characteristic. This amounts to the following :

Canon of Consistency

We must consistently use one and the same characteristic to derive an array of co-ordinate classes from a universe.

The array of classes derived from 'Education' by the Decimal Classification is (1) Teachers, methods etc. (2) Elementary (3) Secondary (4) Adult (5) Curriculum (6) Women (7) Religion etc. (8) University (9) Public schools, state and education. Of these nine classes, (2), (3), (4), (6) and (8) are derived on the basis of Educand Characteristic, while the four remaining ones are on the basis of Problem Characteristic; with the result the array is not homogeneous. The Canon of Consistency is violated and this leads to a violation of the Canon of Exclusiveness as we have already seen.

To respect the Canon of Consistency, the Colon Classification derives two different arrays of classes from Education—one based on Educand Characteristic and another based on Problem Characteristic. Each of these arrays is, therefore, homogeneous.

Group 10. Literature

The following table gives the Decimal translation :

Dec. No.	Sp. Subject
8	Literature
82	English literature
822	English drama
822.33	{ Shakespeare
	{ Hamlet
	{ Criticism of Hamlet
822.39	{ Criticism of Shakespeare,
	{ Marston (John)
	{ Criticism of Marston.

To accommodate *nine* specific subjects, the Decimal Classification has only *five* places. Four specific subjects are driven to the necessity of being huddled together in one and the same number *viz.* 822.33. This is like asking four guests, who happen to belong to the same family, to sit in the same chair because of shortage of chairs. If we remember that each of these four specific subjects may have dozens of different books on it, we can imagine how hopelessly all these books will get mixed up. It will be quite an unhelpful hotchpotch. In a similar way, the two specific subjects 'Marston' and 'Criticism of Marston' have to occupy one and the same number. This phenomenon we have already described as violation of the Canon of Hospitality in Chain.

Another point. Look up the meaning of 822.39 in the schedules of the *Decimal classification*. It is not

'Marston' but 'Minor writers'. This number is to accommodate not one dramatist but all the dramatists of the Elizabethan age, except the eight who have been given eight independent numbers. Crowding so many dramatists in one number is like asking several guests—not related to one another but of co-ordinate status—to occupy one and the same chair. This phenomenon is described as violation of the following :

Canon of Hospitality in Array

An array of classes must contain an independent and exclusive place for every one of the classes that can be derived for it from its immediate universe.

This canon is a more delicate and exacting one than the following :

Canon of Exhaustiveness

The classes in an array must totally exhaust the universe from which the array is derived.

By making 822.39 stand for the residual class 'Minor writers', the Decimal Classification has fulfilled the Canon of Exhaustiveness though it has failed in respect of the Canon of Hospitality in Array.

Bliss and Sayers recognise the Canon of Hospitality. But they appear to make it equivalent to the Canon of Exhaustiveness. Further they do not appear to have brought out that Hospitality is a compound concept made up of the twin ideas, Hospitality in Chain and Hospitality in Array. I myself went through a long period of uneasiness almost amounting to agony until I succeeded in isolating the two species of Hospitality. Once the two species were separated, it was easy to follow up the notational implications of each.

Hospitality in Chain refers to an independent class number being provided for each class in a modulated chain of classes in progressive subordination. The genius of Melvil Dewey harnessed the Decimal Fraction Notation to provide infinite Hospitality in Chain. This notational device is now universally followed. It is followed even in the numbering of parts, chapters and sections in books.

Hospitality in Array refers to an independent class number being provided for each of a homogeneous array of co-ordinate classes. The Colon Classification has devised two methods to provide infinite Hospitality in Array. They are the Octave Principle and the Chronological Device.

The Octave Principle

Consists in numbering the classes in an array as follows : 1, 2, 3, 4, 5, 6, 7, 8, 91, 92, 93, 94, 95, 96, 97, 98, 991, 992, 993, 994, 995, 996, 997, 998, 9991, 9992, 9993, 9994, 9995, 9996, 9997, 9998, 99991 etc. *ad infinitum*.

By introducing the Octave Principle, the Decimal Classification can be made to satisfy the Canon of Hospitality in Array almost in all cases. A note of warning needs to be sounded. In actual practice, in 90% of the cases, the first octave alone will be sufficient. Hence the notation will not have a '9' in it. In about 9% of the cases, there may be need to get into the second octave. In these, no doubt the numbers will carry a '9' in them. It is only in the remaining 1% of the cases there will be need to use the third and the higher octaves. In these few cases, the '9' may occur irritatingly too often. But you must have the bravery to face its recurrence in those few cases at the peril of your having otherwise to force too many to occupy a

single chair *i. e.* violate the Canon of Hospitality in Array.

You should also remember that 1, 91, 991, 9991 etc. are co-ordinate numbers. Simply because the number of digits in them is 1, 2, 3, 4 etc., you should not take them to be a chain of numbers in progressive subordination. In fact the digit '9' is not significant in determining co-ordination and subordination. The digit '9' has, so to speak, emasculated itself, given up its ordinal value and willingly reduced itself to a stepping stone to aid movement from one octave into another. I trust that none of you is so sentimental as to cry that this is too bad a fate for the digit '9' and that you would rather prefer to maintain '9' in its original dignity even at the risk of occasionally violating that tyrannical Canon of Hospitality in Array.

The Chronological Device, which is the second notational means available to propitiate this canon in all cases, will be described when we consider the Colon Classification of the specific subjects of the group under consideration. Consider once more the following item of *Decimal classification*.

823.39 Minor Writers

The term 'Minor Writers' is said to offend the following:

Canon of Reticence

The terms used to denote the classes in a scheme of classification must not be critical.

How can anybody assert who is minor and who is major? At any rate a classificationist has no business to parade his own opinion about the relative value of authors in the schedules of his scheme. This offensive

term can easily be replaced by the colourless but perfectly descriptive one : ' other writers '.

Again, even supposing that a particular author is now so generally taken to be insignificant that there is likely to be no offence in referring to him now as ' Minor ', how can we be sure that he may not, in course of time, rise in public estimate so as to be included among ' Major writers ' ? Witness the vicissitudes in the public estimate of William Blake. Perhaps a more amusing incident is the one affecting the status of Shakespeare himself. In his days, Bodley of the now famous Bodleian Library at Oxford threw away through the window copies of the first quartos of Shakespeare's plays as not worth accessioning. Years later that very library had to pay hundreds of pounds to acquire second-hand copies of them. It is unwise to have a class of such impermanence or to use as characteristic of classification such hazy and impermanent qualities as public estimate. Classificatory science has, therefore, the two following canons :

Canon of Ascertainability

Each characteristic of classification should be readily ascertainable.

Canon of Permanence

Each characteristic should endure unchanged as long as there is no change in the purpose of the classification.

The following table gives the Colon translation of the nine specific subjects of ' Group 10. Literature '.

Col. No.	Sp. Subject
O	Literature,
O :	English literature,
O : 2	English drama,

O : 2 J 64	Shakespeare,
O : 2 J 64 : 51	Hamlet,
O : 2 J 64 : 51 : 9	Criticism of Hamlet,
O : 2 J 64 : 9	Criticism of Shakespeare
O : 2 J 75	Marston,
O : 2 J 75 : 9	Criticism of Marston.

The Colon Classification preserves the order we had preferred. It satisfies the Canon of Hospitality in Chain in each case. The terms in its schedule keep clear of the Canon of Reticence. It has avoided classes and characteristics which come in conflict with the Canons of Ascertainability and Permanence. It also satisfies the Canon of Hospitality in Array by the Chronological Device *i. e.* by representing each author in this case, by a number which represents the year of his birth. For example, Shakespeare is represented by J 64 which is a translation of 1564, which, in its turn, is the year of his birth. Similarly, since Marston was born in 1575, he is represented by J 75. It can be easily seen that an infinity of authors can be given each a distinctive class number by the Chronological Device. This device provides for an infinite Hospitality in Array in a very neat way. It is easily applied. It is the sharpest device known.

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Some of you may ask whether the device will not fail if two or more authors are born in the same year. Such a contingency had been already anticipated and provided for. Look up Rules 633 and 634 of the *Colon classification*. The Chronological Device is applicable not only to the classification of authors but of several other subjects, problems and entities.

Group 3. Medicine

The following table gives the Decimal translation :

Dec. No.	Subject
61	Medicine
611	Anatomy
611.3	Anatomy of digestive system
611.34	Anatomy of intestines
612	Physiology
612.3	Physiology of digestive system
612.33	Physiology of intestines
?	Digestive system
?	Intestines

This table shows forth unerringly a blind spot in the Decimal Classification of Medicine. It provides no Class Number for a general treatment of 'Digestive system' or of 'Intestines' or of any organ whatever. We have a place for the anatomy of an organ, another for its physiology, another for its diseases but none for a general account of it *i. e.* for the anatomy, physiology, diseases and indeed all problems taken together in so far as they relate to the particular organ in question. This amounts to a serious violation of the Canon of Exhaustiveness.

So far as the remaining seven specific subjects provided with class numbers go, the Decimal Classification rearranges them in an order different from what we had already decided as Helpful Order. Indeed the Decimal Classification groups, in the first instance, by problems and within each problem by organs. But while discussing 'Group 3 Medicine' in Chapter 5, we saw that it would be more helpful to group by organs

in the first instance and within each organ class by problems, since there is a greater amount of specialisation by organs than by problems in the pursuit of Medicine.

Next compare the two classes

611·3 Anatomy of digestive system,

612·3 Physiology of digestive system.

In both, Digestive system is represented by '3'. This phenomenon is described as conformity to the following :

Canon of Mnemonics

An entity must be presented by the same digit or set of digits in whatever class it occurs.

Next consider the pair

611·34 Anatomy of intestines,

612·33 Physiology of intestines.

Here 'Intestines' is represented by '4' in the first and by '3' in the second. This is a violation of the Canon of Mnemonics.

The following table gives the Colon translation of the names of the nine specific subjects of 'Group 3. Medicine'.

Col. No.	Sp. subject
L	Medicine
L : 2	Anatomy
L : 3	Physiology
L 2	Digestive system
L 2 : 2	Anatomy of digestive system
L 2 : 3	Physiology of digestive system
L 25	Intestines
L 25 : 2	Anatomy of intestines
L 25 : 3	Physiology of intestines

So far as this table goes, all the Canons of Classification are fully satisfied by the Colon Classification.

We have by now contacted virtually all the important Canons of classification. We shall, without discussion, give the Decimal and the Colon translations for the remaining groups and point out only cases of violation of Canons. If any scheme fails to preserve the order already preferred by us for any group, the corresponding table well enumerate the specific subjects, as hithertofore, in the order in which the scheme has re-arranged them.

Group 1. Agriculture

Colon Translation

Col. No.	Sp. subject
J	Agriculture
J : 2	Manure
J : 4 K 86	Insect infestation of crop plants
J : 57	Weeding
J : 7	Harvesting
J : 7 : 8	Storing of agricultural produce
J 321	Potato farming
J 321 : 2	Manure for potatoes
J 321 : 4 K 86	Insect infestation of potatoes
J 321 : 7	Harvesting of potatoes
J 321 : 72	Potato crop
J 321 : 72 : 8	Storing of potatoes
J 321 : 72 : 84	Cold storage of potatoes

The Colon Classification has preserved the helpful order we had already preferred and has individualised every specific subject *i. e.* satisfied both the Canons of Hospitality.

	Decimal Translation
63	Agriculture
631-55	Harvesting
631-563	Storing agricultural produce
631-8	{ Manure for potatoes { Manure
632-58	Weeding
632-7	{ Insect infestation of crop plants { Insect infestation of potatoes
633-491	{ Potato farming Harvesting of potatoes } Potato crop Storing of potatoes { Cold storage of potatoes

First confining our attention to 'Agriculture in general', we find that the specific subjects denoting various stages of agriculture are deranged in an unnatural and, therefore, unhelpful order. Surely there is no point in 'Harvesting' coming earlier than 'Manure', 'Weeding' and 'Insect infestation'. Such a violation of the Canon of Helpful Order is without any purpose.

The Canon of Hospitality in Chain is violated in three places, as shown by the three brackets. The indiscriminate mixing up of books on different specific subjects of Potato-farming is sure to result in an unhelpful hotch-potch.

Nor are all specific subjects relating to Potato-farming put together in number 633-49 in full conformity to the Canon of Consistency. 'Harvesting' and later related operations are directed to be put with 'Potatoes' (*vide* the instruction "these numbers treat of the material operations of harvesting. Class anything about a definite crop under its special number" given as a note under '631-55 Harvesting' in the *Decimal classification*). But

'Insect infestation of potatoes' has to be denied a place with potatoes and put with general books on 'Insect infestation' as the index to the *Decimal classification* definitely points to it by the following entries: "Potato disease 632.4" and "Potato beetle 632.768".

As for 'Manure for potatoes', there is no indication whether it should be classed with '631.8 Manure' or '633.491 Potato'.

Group 2. Mathematics

Colon Translation

Col. No.	Sp. subject
B	Mathematics
B 6	Geometry
B 6 : 2	Analytical geometry
B 6 : 6	Pure geometry
B 62 : 2	Plane analytical geometry
B 623 : 2	Analytical geometry of quadric curves
B 623 : 2	Analytical geometry of cubic curves
B 63	Solid geometry
B 632 : 2	Analytical geometry of quadric surfaces
B 632 : 6	Pure geometry of quadric surfaces
B 633 : 2	Analytical geometry of cubic surfaces
B 633 : 6	Pure geometry of cubic surfaces

The Colon Classification preserves the order preferred by us. It also individualises each specific subject and satisfies all the Canons. Note particularly the play of 'Mnemonics' in the numbers for the curves and surfaces of similar degrees.

Decimal Translation

Dec. No.	Sp. subject
51	Mathematics
513	{ Geometry
	{ Pure geometry
513·58	Pure geometry of quadric surfaces
513·59	Pure geometry of cubic surfaces
516	Analytical geometry
516·1	Plane analytical geometry
516·22	Analytical geometry of quadric curves
516·26	Analytical geometry of cubic curves
516·42	Analytical geometry of quadric surfaces
516·46	Analytical geometry of cubic surfaces
?	Solid geometry

The Decimal Classification of 'Group 2. Mathematics' presents many difficulties. What does '513 geometry' cover? It appears to be a residual class to hold all geometries other than 'Descriptive geometry' and 'Analytical geometry' which have 515 and 516 for their respective numbers. The application of the Canon of Enumeration confirms this. That is why 'Pure geometry' is shown in the above table against 513. But if a book deals with *all* kinds of geometries, there is no Decimal Number to hold it. This is a violation of the Canon of Exhaustiveness.

In 513·58 and 513·59 it is (the second) '5' that represents 'Solid' or 'Three dimensions'. But in 516·42

and 516.46, it is '4' that represents 'Solid' or 'Three dimensions'. This is a violation of the Canon of Mnemonics. Again in the first of the above pair of numbers '8' represents 'Quadric' or 'Second degree'; and '9' represents 'Cubic' or 'Third degree'. But in the second of the above pair, '2' represents 'Quadric' or 'Second degree' and '3' represents 'Cubic' or 'Third degree'. This is also a violation of the Canon of Mnemonics.

It can also be seen that the Decimal Classification has arranged the specific subjects in an order different from what we had originally preferred as Helpful Order.

Group 5. Animal Husbandry

Colon Translation

Col. No.	Sp. subject
MK	Animal husbandry
MK442	Horse
MK442 : G : 6	Breeding
MK442 : G : 64	Hybridisation

Consider the following table in relation to the above :

G	Biology
G : 6	Genetics, Phylogeny
G : 64	Hybridisation

It can be easily seen that the Canon of Mnemonics is observed to the very finish. In the terminology of the Colon Classification, the device by which this is achieved is called the 'Last Octave Principle'. Look up Rule 662 of the *Colon Classification* and Section 303 and Chapter 33 of the *Fundamentals* to get familiar with this very powerful principle which not only secures automatic conformity to the Canons of Consistent

Order, Helpful Order, Hospitality in Array, Hospitality in Chain and Mnemonics but also leads to great economy in the length of the schedule of classification.

The original home, so to speak, of 'Breeding' and 'Hybridisation' is 'Biology' which is the science of everything connected with living bodies. Whatever numbers are fixed for them in the Basic Schedule of 'Biology' are bodily transferred to represent them in whatever other specific subject they occur as a part. This is a charming trick which the Colon Classification had missed when it was in its first edition. It had, however, taken definite shape by the time the second edition appeared.

Decimal Translation

Dec. No.	Sp. subject
636	Animal husbandry
636.1	Horse
636.10824	Breeding
636.1082431	Hybridisation
	<i>The Basic Schedule of Biology</i>
57	Biology
575	Phylogeny. Genetics
575.282	Hybridisation

In the second of the above tables, it is '5' that represents 'Genetics' or 'Breeding'. But in the first table it is '4' that represents it. Again, in the second table it is '282' that represents 'Hybridisation', whereas '31' represents it in the first table. This shows how the Canon of Mnemonics is violated and how, as a consequence, the schedule has to be lengthened indefinitely by enumerating the basic biological subdivisions *de novo* in every place where they are needed.

Group 6. Law**Colon Translation**

Col. No.	Sp. subject
Z	Law
Z 2	Indian law
Z 2 : 3	Indian law of contracts
Z 2 : 3 : 4	Avoidance in Indian law of contracts
Z 2 : 33	Indian law of partnership
Z 2 : 33 : 4	Avoidance in Indian law of partnership
Z 3	British law
Z 3 : 3	British law of contracts
Z 3 : 3 : 4	Avoidance in British law of contracts
Z 3 : 33	British law of partnership
Z 3 : 33 : 4	Avoidance in British law of partnership
Z Q 2	Hindu law
Z Q 5	Jewish law
Z Q 6	Christian law
Z Q 7	Muslim law

The Colon Classification thus preserves the exact order we had already chosen as helpful. The Canon of Hospitality in Chain is respected and every one of the specific subjects is individualised. The play of 'Mnemonics' also is unmistakable. The Canon of Hospitality in Array is respected by providing a distinct number for the legal systems not only of different nations but also of different religious communities. This it manages to do by a device known as the Subject Device and defined in Rules 66 and 661 of the *Colon classification*.

It may be approached as follows: Along-side the last four divisions of the above table, consider the following table:

Q 2	Hinduism (Post-Vedic)
Q 5	Judaism
Q 6	Christianity
Q 7	Muhammadanism

The last four divisions concern the legal systems of four religious communities. To represent them mnemonically, we must turn to the schedule of religions, which we must expect basically in the Main Class 'Q Religion'. The second of the above tables is really an extract from it. The Subject Device had in this case thus consisted of subdividing 'Z' by the subject numbers Q 2, Q 5, Q 6 and Q 7.

This device is used largely both in the Colon and in the Decimal Classifications—more often in the former. To the extent to which it is used, a scheme gains in automatic conformity to the Canons of Consistent Order, Helpful Order, Hospitality in Array, Hospitality in Chain and Mnemonics.

Decimal Translation

Dec. No.	Sp. subject
34	Law
347	British law
347.4	{ British law of contracts { Avoidance in British law of contracts
347.7	{ British law of partnership { Avoidance in British law of partnership
348	Christian law
349.54	Indian law

349-544	{ Indian law of contracts { Avoidance in Indian law of contracts
349-547	{ Indian law of partnership { Avoidance in Indian law of partnership
?	Hindu law
?	Jewish law
?	Muslim law

The violation of the Canon of Exhaustiveness is indicated by the absence of Decimal Numbers for the last three classes. This also implies violation of the Canon of Hospitality in Array. The violation of the Canon of Hospitality in Array is also indicated by the four pairs of bracketed specific subjects which are obliged to accommodate themselves in one and the same Decimal Number. Again the *Decimal classification* gives as the meaning of 347-7 not 'Law of partnership' but 'Commercial and maritime law'. This again indicates a further violation of the Canon of Hospitality in Chain. Another violation of the same Canon is caused by the fact that '347' represents not only 'British law' but also 'Law of the United States'.

Group 7. Psychology

Colon Translation

Col. No.	Sp. subject
S	Psychology
S0T	Educational Psychology
SM95	Psycho-analysis
SN13	Behaviourism
SN37	Field Psychology

Canon of Hospitality in Array is respected in the above table and the different schools of Psychology are given distinct Class Numbers and arranged in the chronological order in which they got enunciated. This is secured by the use of the powerful Chronological Device described and explained in discussing the Colon Classification of 'Group 10. Literature'. Look up also Rule 63 and its subdivisions in the *Colon classification*. Note that this device makes each new school of Psychology bring its own number in its pocket as it were.

Decimal Translation

Dec. No.	Sp. subject
15	Psychology
150-1943	Behaviourism
153-8	Psycho-analysis
?	Field psychology
370-15	Educational psychology

It is possible to construct the place 150-00137 for 'Educational psychology' in the Main Class '15 Psychology' itself. But this is ruled out as it has been explicitly listed as 370-15.

There is no helpful order provided for the different schools of psychology. They are distributed amidst the detailed divisions of 'Classical Psychology'. This is a violation of the Canon of Helpful Order in addition to the fact that there is no mechanism to fix new schools of Psychology like 'Field psychology' so as to satisfy the Canon of Hospitality in Array.

Further the absence of distinctive numbers for the schools of Psychology brings the scheme into conflict with the Canon of Hospitality in Chain also. For the

psychology of every human group and of every problem can be studied in accordance with the Classical School as well as each of the new schools of psychology ; *e. g.* we can have accounts of ' Anger in old age ' expounded either on Classical basis or on Psycho-analytical basis or on Behaviouristic basis or on Field basis. This implies that the notation must be such that all the divisions of Classical Psychology can also be formed in each school of psychology. There is, at present, no apparatus to secure this in the Decimal Classification. But the concept of ' Amplified Main Class ' developed in the Colon Classification and described in Rules 265 C and 266 C of the *Fundamentals* meets the situation ideally and satisfies the Canons of Hospitality in Array, Hospitality in Chain and Helpful Order without effort.

Amplification of Main Class consists in adding to the digit of the Main Class the Chronological Number of the year of formation of the new school. An amplified Main Class may be subdivided exactly like the unamplified Main Class. The latter provision enables us to individualise any specific subject belonging to any school *e. g.* SN3738 : 524 is the number for the ' Field Psychology of Anger in old age '. Thus the Canon of Hospitality in Chain is respected to the full.

Group 9. Chemical Technology

Colon Translation

Col. No.	Sp. subject
F	Chemical technology
F 4	Salts
F 41150	Common salt
F 41150 : C 433	Sp. heat
F 41150 : E 2201	Solubility

The Colon Classification owes its success in individualising and arranging these specific subjects in the preferred helpful order with such facility and in conformity to all the Canons of Classification in no small measure, to the Last Octave Principle first contacted by us in discussing the Colon translation of "Group 4. Animal husbandry."

Decimal Translation

Dec. No.	Sp. subject
66	Chemical technology
661·4	Salts
664·4	Common salt
664·4000154134	Solubility
?	Specific heat

A reference to the *Decimal classification* will show that whereas 'Salts' come under 'Chemicals', 'Common salt' comes under food. The device by which the Decimal Number is got for 'Solubility of Common Salt' is equivalent to the 'Last Octave Principle' of the Colon Classification—only the connecting symbol is '0001' in the Decimal Classification whereas it is ':' in the Colon Classification. Even this powerful method fails to get a Decimal Number for the 'Specific Heat of Common Salt' as the Decimal Schedule for 'Physics' has not provided a number for the Specific subject 'Specific heat'. Thus the violation of the Canon of Exhaustiveness in the basic subject 'Physics' leads to the violation of the same canon everywhere else.

Group 13. Economics

Colon Translation

Col. No.	Sp. subject
X	Economics
X 7	Public finance

X 72	Taxation
X 724	Income tax
X 7242	Tax on income from Govt. bonds
X7242 : 2	Exemption
X 729	Indirect taxes
X 7292	Stamp duty
X 7292 : 2	Exemption
X 7292 : 2 : 231	in Bombay
X 7292 : 2 : 231 : N 4	in 1940's.

Decimal Translation

Dec. No.	Sp. subject
33	Economics
336	Public finance
336.2	Taxation
336.24	Income tax
336.244	Tax on income from Govt. bonds
336.244	} Exemption
336.294 <i>or</i>	
336.27	Indirect taxes
336.272	{ Stamp duty
	{ Exemption
336.27209547	{ in Bombay
	{ in 1940's

In regard to this group, the Colon Classification is quite alright. The Decimal Classification also is alright except for the uncertainty caused by violation of the Canon of Exclusiveness in fixing the number for 'Exemption from tax on income from Govt. bonds'—a phenomenon similar to what we experienced in 'Group 4. Botany'. We shall get out of the hole by adopting the convention that 'Exemption from a specific tax' should

go with the 'Tax' and not with the discussion of 'Exemption' in general. It is on the basis of this convention that 'Exemption from Stamp duty' is made to share the same number 336-272 with 'Stamp duty'.

In spite of our removing conflict with the Canon of Exclusiveness, the violation of the Canon of Hospitality in Chain still persists in these two cases. The same Canon stands violated also in regard to the last specific subject *viz.* 'Exemption from Stamp duty in Bombay in 1940's' which has to be accommodated in 336-27209547—on the lap, as it were, of its immediate universe 'Exemption from Stamp duty in Bombay'. But, there is every indication that this subject will be given its own independent number in due course. For period subdivisions of geographical divisions are already given for some countries in the *Decimal classification*. Each new edition makes this improvement for one or two countries and India too may get its turn sooner or later.

This progressive attempt to satisfy the Canon of Hospitality in Chain can be realised by comparing successive editions of the *Decimal classification*. To give one example, 'Stamp duty' had no independent number in the thirteenth edition of the *Decimal classification*. It had to be seated along with its brothers on the lap of its immediate universe 'Indirect taxes' *i. e.* made to share the same number 336-27 with the specific subject 'Indirect taxes' and its various subdivisions. But the fourteenth edition has expanded this number by addition of another digit and satisfied the Canon of Hospitality in Chain.

This method of building class numbers *viz.* progressively adding extra digits to individualise specific subjects of greater and greater intension leads to a phenomenon which has been named :

Canon of Relativity

The length of a class number is generally proportional to the degree of intension of the class it represents.

The *Fundamentals* has introduced a terminology, which is somewhat expressive, to describe this method of continuously subdividing a class and adding to the digits of its class number. It calls a 'Class', 'Focus'. The result of subdivision is called 'Sharpening of focus'. I shall deal with this at greater length on the next day. As a preparation, read Chap. 24 of the *Fundamentals*.

Groups 8 and 14

We shall postpone the discussion of groups 8 and 14 to a later day, as it would raise a very advanced idea in classificatory technique.

We have by this time become familiar with several technical terms. You must practise using them. I believe you have experienced how brief and precise our expression becomes if we use them. I shall collect them together for ready reference.

Specific subject. Class Number. Book Number. Call Number. Artificial language.

Universe. Immediate Universe.

Characteristic. Class. Extension. Intension. Canon of permanence. Canon of consistency.

Array. Canon of exhaustiveness. Octave notation. Chronological device. Principle of last Octave. Subject device. Canon of hospitality in array. Canon of exhaustiveness. Canon of helpful order. Principle of increasing concreteness. Principle of evolutionary order. Principle of increasing complexity. Canonical order. Filiatory order. Canon of consistent order.

Chain. Canon of intension. Principle of decreasing extension. Canon of hospitality in chain. Individualisation of subject. Focus. Sharpening of focus. Canon of mnemonics. Canon of relativity.

Canon of currency. Canon of context. Canon of enumeration. Canon of reticence.

CHAPTER 7

FACET ANALYSIS

Facet and Focus

The *Fundamentals* has introduced the concepts of 'Facet' and 'Focus'. These concepts and technical terms have been found to be more elegant than 'Train of characteristic' and the 'Part of the class number corresponding to a single train of characteristic'. I shall endeavour to introduce them to you through the following 48 specific subjects :

Group 1. Medicine (General)

1. Medicine.

Subgroup 1·1 Diseases.

2. Disease.

3. Treatment of diseases.

4. —Do— by physical energy.

5. —Do— by radiation.

6. —Do— by X-rays.

Subgroup 1·2 Infectious diseases (general)

7. Infectious diseases.

8. Treatment of infectious diseases.

9. —Do— by physical energy.

10. —Do— by radiation.

11. —Do— by X-rays.

Subgroup 1.3 Tuberculosis

12. Tuberculosis (general)
13. Treatment of tuberculosis.
14. —Do— by physical energy.
15. —Do— by radiation.
16. —Do— by X-rays.

Group 2. Respiratory System

17. Respiratory System.

Subgroup 2.1 Diseases of Respiratory System

18. Diseases of Respiratory System.
19. Treatment of diseases of Respiratory System.
20. —Do— by physical energy.
21. —Do— by radiation.
22. —Do— by X-rays.

Subgroup 2.2 Infectious diseases of respiratory system

23. Infectious diseases of respiratory system.
24. Treatment of —Do—
25. —Do— —Do— by physical energy.
26. —Do— —Do— by radiation.
27. —Do— —Do— by X-rays.

Subgroup 2.3 Tuberculosis of Respiratory System

28. Tuberculosis of respiratory system.
29. Treatment of —Do—
30. —Do— —Do— by physical energy.
31. —Do— —Do— by radiation.
32. —Do— —Do— by X-rays.

Group 3. Lungs

33. Lungs.

Subgroup 3·1 Diseases of Lungs

- 34. Diseases of Lungs.
- 35. Treatment of diseases of lungs.
- 36. —Do— —Do— by physical energy.
- 37. —Do— —Do— by radiation.
- 38. —Do— —Do— by X-rays.

Subgroup 3·2 Infectious diseases of lungs

- 39. Infectious diseases of lungs.
- 40. Treatment of infectious diseases of lungs.
- 41. —Do— —Do— by physical energy.
- 42. —Do— —Do— by radiation.
- 43. —Do— —Do— by X-rays.

Subgroup 3·3 Tuberculosis of Lungs

- 44. Tuberculosis of Lungs.
- 45. Treatment of tuberculosis of lungs.
- 46. —Do— —Do— by physical energy.
- 47. —Do— —Do— by radiation.
- 48. —Do— —Do— by X-rays.

Consider specific subject 48. Its name can be thrown into the following skeleton form :

Medicine [Lungs] : [Tuberculosis] : [X-ray treatment] .

This skeleton form really separates the terms in the name of the specific subject in accordance with the trains of characteristics of classification to which they respectively relate. 'Lungs' relates to the 'Train of organ characteristics' ; 'Tuberculosis' relates to the 'Train of problem characteristics', and 'X-ray treatment' relates to the 'Train of handling (of disease) characteristics'. The skeleton form of the name of the specific subject suggests the appropriateness of saying that it has three 'Facets' and that these may be respectively called :

- (1) 'Organ facet'; (2) 'Problem facet'; and
- (3) 'Handling facet'.

We may also conveniently use the following mode of expression:—

- (1) 'Lungs' is the 'Focus' in the 'Organ facet' of the specific subject 48;
- (2) 'Tuberculosis' is the 'Focus' in the 'Problem facet' of the specific subject 48; and
- (3) 'X-ray treatment' is the 'Focus' in the 'Handling facet' of the specific subject 48.

Using a similar phraseology in relation to specific subject 47, we may make the following statements.

- (1) 'Lungs' is the 'Focus' in the 'Organ facet' of the specific subject 47;
- (2) 'Tuberculosis' is the 'Focus' in the 'Problem facet' of the specific subject 47; and
- (3) 'Radiation treatment' is the 'Focus' in the 'Handling facet' of the specific subject 47.

The specific subject itself may be thrown in the following skeleton form:—

Medicine [Lungs]: [Tuberculosis]: [Radiation treatment].

By comparing the skeleton forms and the statements of the specific subjects 48 and 47, we may say:—

- (1) The specific subjects 48 and 47 have each three facets;
- (2) The three facets are of the same quality in both the specific subjects;
- (3) The Focus is of the same 'Sharpness' in the 'Organ facet' of both the specific subjects;

- (4) The Focus is of the same 'Sharpness' in the 'Problem facet' of both the specific subjects ; but
- (5) The Focus in the 'Handling facet' is 'Sharper' in specific subject 48 than in specific subject 47.

In fact as we go down from specific subject 45 to specific subject 48, we find that the foci in the organ and the problem facets continue to be the same but the 'Focus' in the 'Handling facet' goes on increasing in 'Sharpness'.

Let us throw the specific subject 44 into the skeleton form. We get :

Medicine [Lungs] : [Tuberculosis].

We find that the 'Handling facet' is absent. Now a book on 'Tuberculosis of Lungs' may devote a chapter or a few pages explicitly to each division based on 'Handling characteristic' or at least to each of several if not all of them. It may deal, for example, explicitly with 'Nursing', 'Etiology', 'Diagnosis', 'Preventive methods', 'Treatment', 'Surgery', 'Diet regulation', 'After-care' and so on. In such a case, the 'Handling facet' is 'Multifocal'. Or it may happen that the book does not deal with these independently and in a clear-cut fashion ; but deals with them in a 'Diffuse' way. Then the 'Handling facet' is 'Diffuse'. As classificatory technique stands to-day, we have to treat both these cases alike and, what is worse, we are obliged to keep the corresponding facet 'Vacant'. In accordance with this convention, a fuller skeleton form for specific subject 44 is

Col. No.	Sp. subject	Dec. No.
1. L	Medicine [Vacant] : [Vacant] : [Vacant]	... 61
2. L : 4	Medicine [Vacant] : [Diseases] : [Vacant]	... } 616
3. L' : 4 : 6	Medicine [Vacant] : [Diseases] : [Treatment]	... }
4. L : 4 : 62	Medicine [Vacant] : [Diseases] : [Treatment by physical energy]	615-83
5. L : 4 : 625	Medicine [Vacant] : [Diseases] : [Radiation treat- ment]	615-831
6. L : 4 : 6253	Medicine [Vacant] : [Diseases] : [X-ray treatment] ...	615-84
7. L : 42	Medicine [Vacant] : [Infectious diseases] : [Vacant]	} 616-91
8. L : 42 : 6	Medicine [Vacant] : [Infectious diseases] : [Treat- ment]	
9. L : 42 : 62	Medicine [Vacant] : [Infectious diseases] : [Treat- ment by physical energy]	
10. L : 42 : 625	Medicine [Vacant] : [Infectious diseases] : [Radi- ation treatment]	
11. L : 42 : 6253	Medicine [Vacant] : [Infectious diseases] : [X-ray treatment]	

12.	L : 421	Medicine [Vacant] : [Tuberculosis] : [Vacant] ...	} 616-995
13.	L : 421 : 6	Medicine [Vacant] : [Tuberculosis] : [Treatment]...	
14.	L : 421 : 62	Medicine [Vacant] : [Tuberculosis] : [Treatment by physical energy]	
15.	L : 421 : 625	Medicine [Vacant] : [Tuberculosis] : [Radiation treatment]	
16.	L : 421 : 6253	Medicine [Vacant] : [Tuberculosis] : [X-ray treat- ment]	} 616-2
17.	L 4	Medicine [Respiratory system] : [Vacant] : [Vacant] ?	
18.	L 4 : 4	Medicine [Respiratory system] : [Diseases] : [Vacant]	
19.	L 4 : 4 : 6	Medicine [Respiratory system] : [Diseases] : [Treat- ment]	
20.	L 4 : 4 : 62	Medicine [Respiratory system] : [Diseases] : [Treat- ment by physical energy]	
21.	L 4 : 4 : 625	Medicine [Respiratory system] : [Diseases] : [Radia- tion treatment]	
22.	L 4 : 4 : 6253	Medicine [Respiratory system] : [Diseases] : [X-ray treatment]	

Col. No.	Sp. subject	Dec. No.
23. L 4 : 42	Medicine [Respiratory system] : [Infectious diseases]: [Vacant]	616-2
24. L 4 : 42 : 6	Medicine [Respiratory system] : [Infectious diseases]: [Treatment]	
25. L 4 : 42 : 62	Medicine [Respiratory system] : [Infectious diseases]: [Treatment by physical energy] :	
26. L 4 : 42 : 625	Medicine [Respiratory system] : Infectious diseases]: [Radiation treatment]	
27. L 4 : 42 : 6253	Medicine [Respiratory system] : [Infectious diseases]: [X-ray treatment]	
28. L 4 : 421	Medicine [Respiratory system] : [Tuberculosis] : [Vacant]	
29. L 4 : 421 : 6	Medicine [Respiratory system] : [Tuberculosis] : [Treatment]	
30. L 4 : 421 : 62	Medicine [Respiratory system] : [Tuberculosis] : [Treatment by physical energy]	
31. L 4 : 421 : 625	Medicine [Respiratory system] : [Tuberculosis] : [Radiation treatment]	
32. L 4 : 42 : 6253	Medicine [Respiratory system] : [Tuberculosis] : [X-ray treatment]	

33.	L.45	Medicine [Lungs] : [Vacant] : [Vacant]	?
34.	L.45 : 4	Medicine [Lungs] : [Diseases] : [Vacant]	...	} 616-24
35.	L.45 : 4 : 6	Medicine [Lungs] : [Diseases] : [Treatment]	...	
36.	L.45 : 4 : 62	Medicine [Lungs] : [Diseases] : [Treatment by physical energy]		
37.	L.45 : 4 : 625	Medicine [Lungs] : [Diseases] : [Radiation treatment]		
38.	L.45 : 4 : 6253	Medicine [Lungs] : [Diseases] : [X-ray treatment]		
39.	L.45 : 42	Medicine [Lungs] : [Infectious diseases] : [Vacant] ...		
40.	L.45 : 42 : 6	Medicine [Lungs] : [Infectious diseases] : [Treat- ment]		} 616-246
41.	L.45 : 42 : 62	Medicine [Lungs] : [Infectious diseases] : [Treat- ment by physical energy]		
42.	L.45 : 42 : 625	Medicine [Lungs] : [Infectious diseases] : [Radiation treatment]		
43.	L.45 : 42 : 6253	Medicine [Lungs] : [Infectious diseases] : [X-ray treatment]		
44.	L.45 : 421	Medicine [Lungs] : [Tuberculosis] : [Vacant]	...	
45.	L.45 : 421 : 6	Medicine [Lungs] : [Tuberculosis] : [Treatment]	...	} 616-246
46.	L.45 : 421 : 62	Medicine [Lungs] : [Tuberculosis] : [Treatment by physical energy]		
47.	L.45 : 421 : 625	Medicine [Lungs] : [Tuberculosis] : [Radiation treatment]		
48.	L.45 : 421 : 6253	Medicine [Lungs] : [Tuberculosis] : [X-ray treat- ment]		

Some observations are obvious about the Colon Classification :

1. It preserves the Helpful Order preferred.
2. It satisfies the Canon of Hospitality in Chain in all cases *i. e.* it individualises each of the 48 specific subjects *i. e.* it provides a distinctive Colon Number for each of them.
3. It satisfies the Canon of Mnemonics without any fault whatever *i. e.* the same idea is translated into the same number wherever it occurs.
4. The play of the Canon of Relativity appears to be inevitable.
5. The Colon Numbers show forth the 'Facets' very markedly, the symbol or number (:) indicating change of 'Facets' or, to put it in another way, acting as the 'Connecting symbol' between two adjacent 'Facets'.
6. The vacant facet is omitted in Colon Numbers, unless a unifocal facet follows it.
7. The formation of distinct facets in the Colon Number gives freedom for the 'Sharpening of the 'Focus' in any facet at pleasure without in any way being hampered by what happens to the focus in any other facet; the same degree of freedom exists also to keep any facet vacant without in any way being hampered by what happens to any other facet.

The following are some obvious observations on the Decimal Translations :

1. There is no Decimal Number that can represent the specific subject of a book that deals at once with many problems connected with 'Respiratory System' or with 'Lungs' or with any specific organ. To use technical terminology, a specific subject of 'Medicine'

which is unifocal in 'Organ facet' but multifocal in 'Problem facet' cannot be translated into a Decimal Number.

2. Only 10 of the remaining 46 specific subjects have close-fitting Decimal Numbers. The remaining 36 specific subjects cannot be distinguished from classes of which they are subclasses. This is a measure of the violation of the Canon of Hospitality in Chain involved.

3. So far as the 10 specific subjects properly translated go, the Decimal Numbers throw them in an order different from the preferred Helpful Order. In particular, while a general account of certain modes of treatment like 'Radiation treatment' and 'X-ray treatment' of diseases without reference to the organ affected come earlier than diseases of particular organs, general account of diseases like 'Infectious diseases' and 'Tuberculosis' without reference to the organ affected come later than diseases of particular organs. This violates not only the Canon of Helpful Order but also the Canon of Consistent Order.

4. The Canon of Mnemonics does not appear to have been specially provided for. Witness for example the final digit '6' corresponding with 'Tuberculosis' in the Decimal Number 616·246 of specific subject 44, while it has the digit '5' to correspond with it in the Decimal Number 616·995 of specific subject 12.

5. The absence of a special connecting symbol between facets stands in the way of the focus of any but the last facet being sharpened. This accounts for violation of the Canon of Hospitality in Chain in many cases.

By way of illustration let us make a Facet Analysis of the Decimal Number 616·2 of specific subject 18.

We get 61 = Medicine

6 = Diseases [Problem facet]

2 = Respiratory System [Organ facet].

The incidence of the 'Organ facet' after 'Problem facet' makes it impossible to sharpen the focus in the latter by the addition of extra digits. We are, therefore, forced to use the same Decimal Number '616·2' for three successive links in the same chain *viz.* Diseases of Respiratory System, Infectious diseases of the Respiratory System and Tuberculosis of the Respiratory System.

But the 'Organ facet' admits of its focus being sharpened by the addition of extra digits. For example we get the Decimal Number 616·24 for specific subject 34. Here 'Facet Analysis' gives

61 = Medicine

6 = Diseases [Problem facet]

24 = Lungs [Organ facet].

Now consider Decimal Number 616·246 for specific subject 44. We get, on analysis,

61 = Medicine

6 = Diseases [Problem facet]

24 = Lungs [Organ facet]

6 = Tuberculosis [Problem facet].

When hard pressed to sharpen the focus in the 'Problem facet' the Decimal Classification is driven to the necessity of attaching a 'Problem facet' once again after the 'Organ facet'. This is a remedy in despair. The formula of facets thus becomes

Medicine [Problem] [Organ] [Problem],
not a very happy medley.

If we are forced by the appearance of a new class of books to sharpen the focus in the 'Organ facet', either we plead inability as a result of its having been check-mated by the reappearance of the 'Problem facet' after it or we add to the medley in the formula of facets by making the 'Organ facet' reappear after the second 'Problem facet' and get the following

Medicine [Problem] [Organ] [Problem] [Organ].

This alternation must go on indefinitely. The world of knowledge is sufficiently varied and powerful to make this run to a ridiculous extent.

All this trouble is traceable to their being no connecting symbol between adjacent facets in the Decimal Number. To put it in other words, there is no means of indicating change of characteristic in Decimal Numbers. The chief contribution of Colon Classification is the implementing of the results of 'Facet analysis' by providing the special symbol ':' for the above purpose.

B. I. Palmer has gone into the question of adapting the Decimal Notation to the findings of 'Facet analysis'. He has done so in a paper entitled, *Does Colon point a way?* presented to the sixth All-India Library Conference held at Jaipur in April 1944. The paper is announced to be published by the Indian Library Association in the *Proceedings* of the Conference. At present the decimal point in the Decimal Notation is virtually functionless and without any ordinal value. Why not give it a value between 0 and 1 and make it function or, to use Palmer's words, "use the point as a separating device, to indicate a change of characteristic in the subdivision?" Palmer goes still further and adds, "The most drastic step is to abolish the existing

schedules as they stand together. Doubtless this strikes fear into the heart of every hearer. Abolish the schedules, and you abolish Dewey, they well say. Yet what is the purpose of D. C.? Is it to maintain an out-of-date conception or is it to reduce to some sort of order the welter of books and ideas that pour in upon us from day to day? There is no point in retaining the physical form of D. C. unless we retain its spirit." He then refers to what has been already done in the Colon Classification and says, "The point there has become a colon; but we cannot therefore decide that a revised D. C. would only be half as good."

Before concluding, let me emphasise that facets are not qualities of class numbers; nor are they peculiar to the scheme of classification used: On the other hand, facets inhere in the subjects themselves *i. e.* they exist in the subjects themselves whether we sense them or not. The subjects will be helpfully featured and their arrangement will be rendered filiatory and helpful if recourse is had to facet-analysis and if the class numbers feature the facets properly—and in particular if the method of building class numbers admits of each facet being kept intact and of its focus being sharpened to any desired degree as is the case in Colon Classification and does not involve the dismemberment and scattering of a facet and of the alternation of facets in order to arrive at the required sharpness of focus in each facet as it happens in the Decimal Classification.

CHAPTER 8

PHASE-ANALYSIS

Phase-analysis is another useful concept developed in the *Fundamentals*. We shall approach it through particular cases.

Octave Phase

Consider specific subject 101 occurring in 'Group 9. Chemical Technology' in Chapter 6. It is 'Solubility of Common Salt'. Here, 'Common Salt' is a commodity and is therefore a subclass of the Main Class 'Chemical Technology'. 'Solubility' is a chemical property and is therefore a subclass of the Main Class 'Chemistry'. Thus this specific subject involves two main classes; in fact it is a compound of 'Solubility' belonging to 'Chemistry' and 'Common Salt' belonging to 'Chemical Technology.' These are called its two 'Phases'. 'Common Salt', the more concrete of the two, is the 'Primary phase' and 'Solubility', the more abstract, is the 'Secondary phase'. The 'Primary phase' is the main subject of study; the 'Secondary phase' is usually the tool or method of investigation or is the aspect of the 'Primary Phase' studied. It is the last of these in this specific subject. A 'Secondary Phase' playing such a role is said to be of the 'Third species' according to the *Fundamentals*.

To classify a 'Two-phased' specific subject with the secondary phase of the 'Third species', we normally translate each 'Phase' and connect the two phases of the Class Number, with the primary written first, by a special symbol. In the Colon Classification, the special symbol is in most cases (:). In the Decimal Classification, it is '.0001'. Thus the Colon translation of the above specific subject is

F 41171 : E 2201

where F 41171 = Sodium chloride (Common Salt) ;

: is the connecting symbol ;

and E 2201 = Solubility.

Its Decimal translation is

664.40001541344

where 664.4 = Sodium chloride (Common Salt) ;

0001 is the connecting symbol

and 541344 = Solubility.

In the same way, the 'Phase-Analysis' of specific subject '102 Specific heat of Common Salt' also occurring in 'Group 9. Chemical technology', yields 'Common Salt' as the 'Primary Phase' and 'Specific heat' as the 'Secondary Phase'. Its Colon translation is therefore,

F 41171 : C 433

where F 41171 = Common Salt ;

: is the connecting symbol ;

and C 433 = Specific heat.

We have seen in 'Chapter 6' that 'Specific heat of Common Salt' has no exact Decimal translation as a result of 'Specific heat' having no Decimal Number.

To this species of two-phased specific subjects belong also 19 and 56 occurring in 'Group 5. Animal husbandry'. The 'Phase Analysis' of specific subject 19 yields 'Horse' as the 'Primary phase' and 'Breeding' as the 'Secondary Phase'. Its Colon Number is, therefore,

M K 441 : G : 6

where M K 441 = Horse ;

: is the connecting symbol ;

and G : 6 = Genetics (a division of the Main Class 'Biology').

In a similar way the specific subject '56 Hybridisation of Horse' has 'Horse' as 'Primary Phase' and 'Hybridisation' as 'Secondary Phase'. Its Colon Number is, therefore,

M K 441 : G : 64

where M K 441 = Horse ;

: is the connecting symbol ;

and G : 64 = Hybridisation (a division of the Main Class 'Biology').

In the Decimal Classification, if the results of 'Phase-Analysis' are taken advantage of, the Decimal Number for the specific subjects 19 and 56 will respectively be

636.1000157513 ;

and 636.10001575282

where 636.1 = Horses ;

0001 is the connecting symbol ;

and 57513 = Breeding ;

and 575282 = Hybridisation.

But that scheme does not do so, but gives *ad hoc* subdivisions under '636.1 Horse' directly thereby making the specific subjects look 'Single-phased'. These numbers are respectively

636.10824

and 636.1082431.

This practice of improvising *ad hoc* number for two-phased specific subjects is quite common in the Decimal Classification. This practice often leads to violation of Canons of Mnemonics and of Consistent Order. It also results in adding to the length of the schedule. In its first edition the Colon Classification

also was doing similarly. It is all due to the concept of 'Phase-Analysis' not being consciously handled and utilised.

In its second edition, the Colon Classification became slightly more aware of it and cut out unnecessary *ad hoc* subdivisions wherever the 'Last Octave Principle' could provide an appropriate number. It is in the *Fundamentals* that the concept of 'Phase-Analysis' was brought to an objective and conscious level. The Decimal Classification too can shorten its schedule in many places, if 'Phase-Analysis' is taken advantage of.

Bias Phase

Consider specific subject 36 in 'Group 7. Psychology' given in Chapter 6. It is 'Educational Psychology'. It thus involves two main classes *viz.* 'Education' and 'Psychology' and it is, therefore, of two 'Phases'. Of the two subjects, it is 'Psychology' that forms the subject of exposition and it forms, therefore, the 'Primary Phase'. The subject 'Education' is the 'Secondary Phase' because it merely indicates the subject towards which the exposition of 'Psychology' is biased. A 'Secondary Phase' of this kind is called a 'Bias Phase' and is said to be of the second species. The connecting symbol in such a case is '0' in the Colon Classification and '0001' in the Decimal Classification.

The Colon Number for 'Educational Psychology' is, therefore,

S 0 T

where S = Psychology

0 is the connecting symbol

and T = Education.

Similarly its Decimal Number must be

370·0015

where 37 = Education ;

0001 is the connecting symbol ;

and 15 = Psychology.

But the complete tables in the *Decimal classification* give the *ad hoc* number 370·15 thereby adding to the length of schedule and putting '0' to more than one use thus necessitating a note of caution like the following which occurs in the introduction to 'Table 2. Common subdivisions' at page 1628 of the thirteenth edition :

" These divisions introduced by 0, 00, or 000 may be annex to the number for any subject if 0 or 00 divisions are not already specifically provided under that subject."

Even in cases where '0001' is used as the connecting symbol, it must be remembered that 'Bias Phase' cannot be distinguished from 'Last Octave Phase' in Decimal Numbers as the same connecting symbol is prescribed in both cases.

Influencing Phase

Consider specific subject 50 occurring in 'Group 15. Political science'. It is termed 'Geopolitics'. It stands for the study of 'Political Science as influenced by Geography'. It thus involves two different subjects, which form its phases. 'Political Science' is the subject of exposition and is, therefore, the 'Primary Phase'. 'Geography' is merely the subject whose influence on the 'Primary Phase' is studied. It is, therefore, the 'Secondary Phase'. We shall call it the 'Influencing Phase'. Even when the *Fundamentals* was written, I was not able to isolate this 'Species of Secondary Phase'. I had recognised its possibility. But not having had

enough experience with books whose specific subjects involved such a phase, I could not either name it or invent a suitable connecting symbol. But during the last few days, my friend P. K. Garde, librarian of the Podar College of Commerce, had independently brought to my notice quite a handful books recently published on 'Geopolitics'. He had sensed that these presented a new phenomenon and had been experimenting with possible filiatory positions for such books. He had decided that it would be too forced a step to treat 'Geopolitics' as 'Political Science with a bias towards Geography' although that was the only course open at the stage at which 'Phase-Analysis' had been left by the *Fundamentals*. A deep discussion with him led us to recognise this as a 'Fourth species of Secondary Phase' to be separated from the second species *viz.* Bias phase into which it had been crowded provisionally in the *Fundamentals*. This book had referred to such a crowding and enunciated it as 'Unsolved Problem 6' in the following terms: "The very definition given in Rule 302 of this book implies that the Secondary Phase of the Second Species is a mixture. Though no scheme has so far succeeded to 'rule', the definition manages 'to divide' and mention at least three different subspecies :

- (1) Written for those interested in the Bias Class ;
- (2) Showing the influence of the Bias Class ;
- (3) Instituting comparison with the Bias Class.

"A more powerful analysis will be able to 'divide' still further and lay bare other categories varying from one another in subtle ways. These have yet to be isolated and provided with distinctive Connecting Symbols.

"This is Unsolved Problem No. 6."

My discussion with Garde has made me decide tentatively on the concept 'Influencing Phase' and call it 'Secondary Phase of the fourth species'. As an alternative proper name, I shall call it 'Garde Phase', as it was Garde that helped me to deal with it.

The question is, what should be the Connecting Symbol? Books with the several 'Influencing Phases' really indicate how the subject of the 'Primary Phase' gets beaten to shape—in 'Geopolitics', for example, we see how 'Political Science' gets beaten to shape under the influence of 'Geographical Factors'. We can also conceive of a specific subject in which 'Political Science' gets beaten to shape under the inference of 'Economic Factors' and of a specific subject in which it gets beaten to shape under the influence of 'Sociological factors' and so on. These specific subjects may be looked upon as 'Pre-forms of Political Science'. If so, these must be given a position anterior to the ordinary treatises on 'Political Science' and as close to them as possible. These considerations would make me reverse the order given to the specific subjects 'Political Science' and 'Geopolitics' in 'Group 14' in Chapter 5 and arrange them in the order.

Geopolitics

Political Science

To preserve this preferred order, we may use $\alpha 8$ as the connecting symbol for the 'Influencing Phase'. Thus, the Colon translations of the specific subjects of 'Group 14' will be as follows :

Col. No.	Sp. subject
W $\alpha 8$ U	Geopolitics
W	Political Science

I am unable to think of a suitable connecting symbol in the Decimal Classification. But this concept is not altogether foreign to that scheme as can be seen from the following note which occurs in the complete tables under '15 Psychology'.

"For interrelations of psychological topics use 0005 divided like 150, e. g. Conception and Perception 153·1000527

where 153·1 = Conception ;

0005 is connecting symbol ;

and 27 which is extracted

from 1527 = Perception.

Can we then use '0005' as the connecting symbol for the 'Influencing Phase'?

Common Subdivision Phase

Consider the specific subjects of 'Group 8. Geography'. Specific subject 48 is of the main class of the group and is a treatise or text-book in the normal expository form. The other five specific subjects also have 'Geography' for their subject matter; but they indicate different forms of exposition, 17 is 'Bibliography', 58, 68 and 97 are 'Periodicals' and 65 is 'Proceedings of a Conference'. These specific subjects are said to be two-phased, with 'Geography' as the 'Primary Phase' and the 'Form of exposition' as the 'Secondary Phase'. It has now become more usual and it is also more appropriate to call it 'Common Subdivision Phase' rather than 'Form phase'. In the *Fundamentals*, this is said to be 'Secondary phase of the first species'. In the Colon Classification, there is no need for a connecting symbol for Secondary Phase of the first species. The connecting symbol is evaded by representing 'Common

subdivisions' by a distinctive species of symbols *viz.* lower case letters of the Roman Alphabet. The Colon Classification is the beneficiary of another happy hit. It has ruled that the ordinal value of a class number with a lower case letter is lower than that part of it which is got by omitting the portion beginning with the lower case letter, *e. g.* C 6 *a* is to come earlier than C 6; L : 4 : 7 *m* 3 : N 14 is to come earlier than L : 4 : 7; and W *z* 8 U is to come earlier than W. Look up p. 15 of H. E. Bliss's *A system of bibliographic classification* for an evaluation of the anterior position thus secured for specific subjects with a Common Subdivision Phase.

In the Decimal Classification, the connecting symbol for 'Common subdivision phase' is '0'. It, therefore, turns out that specific subjects with 'Common subdivision phase' cannot have anterior positions. General books on '51 Mathematics' will be separated from general books on '511 Arithmetic': for example, by '510.3 Cyclopaedias in Mathematics', '510.4 Mathematical Periodicals', '510.63 Proceedings of Mathematical Conferences' and so on.

Here are the Colon and the Decimal translations of the five specific subjects of 'Group 8. Geography' which have 'Common subdivision phases'.

Col. No.	Sp. subject	Dec. No.
U <i>a</i>	Bibliography of Geography	016.91
U <i>m</i> 2 : N 26	Indian Journal of Geography	} 910.4
U <i>m</i> 3 : M 30	Journal of the Royal Geographical Society	
U <i>m</i> 3 : M 84	Scottish Geographical Magazine	
U <i>p</i> 1 : M 50	International Geographical Conference	} 910.63

The above table shows that the different periodicals in a subject get a distinctive class number and thus get individualised in the Colon Classification. But they all get one and the same Decimal Number. The result is that the Decimal Classification does not mechanise either the keeping together of the volumes of a particular periodical or of maintaining a preferred order among the different periodicals. As they all get the same class number, all the volumes of all the periodicals in a subject will get promiscuously mixed up if we depend for their arrangement on their class numbers alone. In the Colon Classification, the periodicals in a subject get grouped by their country of origin and those originating from the same country will get arranged among themselves by their respective years of commencement. Such a helpful individualisation is made possible in the case of most of the 'Common subdivisions' in the Colon Classification. As to how this is managed, look up the rules in 'Chapter 2 Common subdivisions' of Part 1 of the *Colon classification*. You can easily recognise that practically all the rules amount to fitting up 'Facets' to 'Common subdivisions'. Some of them get 'Chronological facets' and some both 'Geographical' and 'Chronological' facets. It would be a great advantage if the 'Common subdivisions' of the Decimal Classification also can be treated similarly.

The 'Common subdivisions' was the 'Secondary Phase' that came to be recognised earliest; but then the 'Phase concept' had not taken shape in the early years of the Decimal Classification. The result has been that 'Facets' and 'Phases' had got promiscuously mixed up. To give one example, specific subjects concerned with a descriptive or historical account of the economic

make-up of a country do present a 'Geographical facet' inevitably. And yet the Decimal Classification fails to provide such a facet and leaves the 'Common subdivision phase' to look after it. The result is that the same Decimal Number has to be shared by the above specific subject and the 'History of Economic Science'.

To quote B. I. Palmer (*Library Association record*, v. 46, p. 185, 1944), "The reason for the growing failure of Dewey to cope with the demands of books and articles at the deeper levels, is at once revealed to be due to a confusion of the phase, facet and focus."

Like 'Facets', 'Phases' too are inherent in the specific subjects themselves. They are not created by a scheme of classification. It is the duty of a scheme of classification to recognise the presence of phases and facets in specific subjects and to have them truly represented in the Class Numbers. Then only will the arrangement brought about by Class Numbers be Helpful and satisfy the various Canons of Classification.

CHAPTER 9

HOW OF LIBRARY CLASSIFICATION

We began with the statement that Class Numbers constitute an artificial language of ordinal numbers designed to mechanise the filiatory arrangement of specific subjects. The determination of Helpful Order does not necessarily require a scheme of classification. As we saw in chapters 4 and 5, it can be done from first principles. But to preserve that order, to keep to that order consistently whoever deals with it or whenever he does so and to restore order among the books without the necessity to read them everytime—for these purposes,

we do want a scheme of classification. That scheme is helpful which recognises and provides for the Facets and Phases in the specific subjects.

Dictionary and Grammar

The schedules of classification form the dictionary of the classificatory language. If it is to form a true dictionary and not a mere phrase-book, the schedules will list, not names of specific subjects, but only basic concepts that occur as foci in their facets, out of which the translations of the names of specific subjects can be built up. And for building them up, rules are necessary. These rules correspond with the grammar of a language.

Classificatory Translation

Classificatory translation, however, differs from ordinary literary translation in one respect. For a classificatory language is invariable and translation into it is, therefore, a steady one-way process which can have only one conventionally perfect result. In the process of literary translation on the other hand a continual, subtle interchange takes place between two equally plastic elements, till their differences are resolved in a final adjustment. Since both parties to the intercourse (both, languages) are, so to speak, living personalities, only a living personality can result. And the same partners may produce other children, each perfect in its own way as an expression of their union but bringing out, now more, now less, of this or that capacity or characteristic of his parents—the same text, if it is at all highly organised, may be ‘perfectly’ translated in different ways. Perfection here is not scientific because both terms are almost indefinitely variable.

Not so in the case of translation into a classificatory language. If it be so, it would be fatal to the very

purpose of classification which is to preserve a preferred order without variation in as mechanical a manner as possible. A classificatory translation is not only formally pre-determined, but the process also is governed by the fact that one pole is fixed and the whole operation is canalised in the translator's mind by the facets and the phases. For the classifier in whom Phase- and Facet-Analysis have become second nature, classification is an almost automatic process: his thought is guided from the start by the preferred scheme of classification.

Canalisation

A critical examination of the title and the contents of the book is a necessary precaution against ambiguity, vagueness and rhetoric. The examination should follow the route prescribed by the needs of the preferred classificatory language. The classifier must have a keen eye for specific details. His purpose must be to bring out the dominant specific subject (Primary Phase) in full and the adjectival ones (Secondary and other phases) in due subordination and in proper sequence so as to expose the author's intention and achievement. To lay bare the specific subject of every book in this way would be a tortuous and wasteful task without the aid of the matrix supplied by the scheme of classification. All this preliminary analysis for the enunciation of the specific subject in the form demanded by the classificatory language, is 'Canalisation'. Proper translation depends on correct canalisation.

Translation Proper

Once canalisation is completed and the name of the specific subject settled by pouring (so to speak) the properly selected, prepared and amplified words of ordinary language into the mould made with the aid of

Phase- and Facet-Analysis, the final step is a simple affair of substituting from dictionary (schedules)—occasionally with the aid of grammar (rules)—equivalent ordinal numbers for the selected words. This last step is translation proper. It is here that real metempsychosis takes place—the same soul appears in a new body, the old having been made of the words and the new one being made of ordinal numbers.

Apart from fulfilment of the Canons of Classification, a secondary measure of the value of a scheme of classification is the extent to which it provides clear-cut matrices to help the enunciation of specific subject by correct canalisation. In this the Colon Classification, which is the latest, scores naturally over the Decimal Classification which was the very first. Let us vary the figure. Compare a classifier with a person working his way through a forest during night towards the home of a host (specific subject) who lives somewhere in the heart of the forest. The difficulties—the uncertainties, the disappointment caused by the difficult terrain—treacherous with its hillocks, valleys, unfordable streams and so on—the absence of a guide to the direction in which the home of the host lies, and the multitudinous division of pathways the sign-posts at which are invisible on account of the darkness—will be similar to the traveller and the classifier. But suppose the host puts up a powerful lamp at the top of his house, so that it is visible from a distance. Then it will act as a beacon to the traveller and minimise his trials. Any good scheme of classification gives a similar help to the classifier in working his way towards the specific subject of a book. The Decimal Classification does give that much of help.

The traveller will be helped much more if the light put up by the host is a search-light which not only acts as a beacon but also lights up the region through which he has to walk. Then will not merely the goal be glimmering but every inch of the path will be illumined. The 'Formulæ of facets or characteristics' furnished for each Main Class and Canonical Class by the Colon Classification coupled with the Phase-Analysis which is adopted by it quite consciously serve the purpose of such a search-light to the classifier. To quote from the *New vistas in classification* by B. I. Palmer appearing in the 1944 October issue of the *Library Association record* of Great Britain, "For the first time, practical classification can claim to approximate to a science...Normally, while most students could grasp the theory of classification, when it comes to the practice, they found it demanded an elusive gift called "flair". For "flair" Ranganathan has substituted reasoned analysis: perhaps "flair" was an intuitive form of the same process? Ranganathan's new book brings the whole problem from the regions of subconscious perception to those of the intellect. This act makes it at once possible to train any intelligent person to classify, instead of merely demonstrating to the classification-aspirant, and then hoping for the best.

"In using such a scheme as Dewey, we are instructed to classify "first by subject, then by form". But is it always as simple as this? Too often the subject is lost in a welter of relationships and the task of deciding to which class a book belongs can be quite a major task when it rests on flair. And as A's flair is not always B's flair, anomalies creep in which can vitiate the work of the classifier: a work which aims at reducing conflicts to a minimum".

“Now apply the method taught in this new work (*Fundamentals*) and the task becomes susceptible to a methodical approach”.

I have now placed before you the ‘Elements of library classification’. I am hopeful that you look upon them as something not altogether incomprehensible. To me they are fascinating. They have a value beyond the narrow and immediate purpose which makes you pursue them. Classification is a way of thinking. It is a way of thinking systematically and purposefully. It has, therefore, the same general value as any academic subject, like mathematics or linguistics or philosophy in a university course.

CHAPTER 10

EPILOGUE

To the Brother Librarian

The reasons for which books are studied ought not to be very different from the reasons for which they are written. Why are books written? Am I asking too much of my brother librarians who are my readers in expecting my reasons to be also theirs? Every writer should face this sort of question, and the readers of books as well. An ambiguous situation arises when books are read for reasons other than those for which they are written; or when the writer, conscious that the reasons of writing books are frequently not the reasons for reading them, allows himself other reasons in order to have readers.

My writings on subjects other than ‘Classification’ have been described as simple, lucid, gripping and so on. Some have even been described as ‘thrillers’. But as a writer on ‘Classification’, I have been persistently

accused of 'difficulty'. I therefore feel that there is due from me an explanation of the baffling effect that my writings on 'Classification' have for a large number of librarians. It would be unpleasantly disingenuous of me to publish yet another book on 'Classification' without acknowledging a complaint which I know to be common among friends and foes alike. I do not think that the complaint is a legitimate one; but, on the other hand, I am not indifferent to it. No classificationist genuinely moved by the reasons of classification can be indifferent to the accusation that his writings on classification make inaccessible to classifiers that which it is their function to uncover.

Why does a librarian classify at all? He classifies to uncover to himself—to make it readily available to readers—everything that the library has on anything. Comparatively few devote any time at all to practical classification; yet many would agree that the resources uncovered by close classification are extremely important to know. This raises the question: why so many do not practise close classification.

Some do not classify closely because it embarrasses them to try to be as serious as such a classification demands. Others disbelieve in the sincerity of classificationists, feeling that they affect a humanly impossible seriousness. Then there is a class of librarians who have a vague good will towards classification and classificationists, but who feel that the rewards are small compared with the amount of time and energy necessary—that close classification is much too hard work.

Some librarians have a natural and wholesome disinclination to classify closely, which deserves to be respected; as we respect those who, conscious that they

lack the proper qualifications of experience or judgment, modestly refrain from advancing opinions on some controversial subject. But there are also some who, from their education and sensibility of mind, might be expected to practise close classification, and yet do not. The strongest single reason why they do not is miseducation as to the reasons of classification. They have acquired either the impression that classification is based on fancied experience and yields only a fanciful kind of result, or the impression that the full benefits of classification can be obtained in ordinary ways, without close classification involving tediousness of reading books through and finding all their important foci in their accurate forms.

Because of this background of miseducation from which most librarians come to classification, I utilised the opportunity offered by the University of Bombay through Dr. P. M. Joshi to begin the subject on the most elementary plane of understanding and to proceed to the plane of close classification (or uncovering) by steps which deflect the reader from false associations and false reasons for classifying. No librarians but those who insist on classifying for the wrong reasons should find close classification difficult; no librarian who classifies for the right reasons should find it anything but proper.

But what are the right reasons for classification—and, if there is so much miseducation, do most librarians who classify broadly do so for the wrong reasons? And—a still more pressing question—is a scheme of classification that does not aim at closeness but finds a large number of practitioners likely to have been designed for the wrong reasons?

Classification is an uncovering of the thought-content of a book. It is what it should be only when the thought-content as a whole is uncovered including the primary and the secondary phases and the facets by those faculties which apprehend in terms of entirety rather than in terms merely of parts. The classificationist who designs a scheme for the right reasons has felt the need of exercising such faculties, has such faculties. The classifier who applies a scheme for the right reasons is asking the classificationist to accentuate these faculties and to provide him with an occasion for exercising them. But corruption of the reasons of classification sets in—in both the classificationist and the classifier—when the classifier goes to classification with no notion whatever of the faculties required.

The history of designing classification and classifying is in large part a history of such corruption.

Not only am I aware of the effect or extreme difficulty that my books on classification and my scheme of classification have had for the majority of readers, but I offer voluntarily the statement, in one sense of difficulty, more difficult schemes would be difficult to find. My awareness of exactly how difficult it is gives me, however, the right to say why it is so: because it has been designed for all the reasons of classification. If you accuse me of difficulty after an honest attempt to classify at least a thousand assorted books in the wave-front of knowledge to-day for the full reasons of classification, you will realise that you imply that a classification scheme is to be designed only for just a few of the reasons of classification. If you approach my scheme and my books on classification without restricting the reasons of classification within the confines of

convention and after at least a hundred hours of intensive reference service in a busy library, you will not only see that they are not difficult: you will discover in yourself reasons for classifying to a degree of closeness that you have largely neglected in previous classificatory work.

If you desire to view the whole subject of classification from the position I take, know readers and know books in and out. Do not feel shy of either. Take your mission as establishing contact between the right reader and the right book exactly and expeditiously and without any fumbling. You will then see that no scheme of classification can be too close or too complicated. You will also see that the reader is not concerned with your notation or with the how of your classificatory technique except in its very superficies. The service of classification can reach him in difficult situations only through you; in other words the classification in its deepest embellishments has to be intelligible only to you, though an intelligent reader may be prepared to share them with you. It will even be experienced that the extent to which a reader of a library contacts the profound manifestations of class numbers will be proportional to his capacity to face them, to understand them and to put them to helpful use; it will also be proportional in the same measure to the depth, the profoundness and the subtlety of the thought he seeks to feed upon or the library provides.

If these are conceded, you will realise what an escapist attitude is implied when a librarian says, "Don't be close in your classification. Don't go closer than what Dewey prepared us for, about half a century ago.

For the public cannot stand it ; it will be scared away by it ; I too, therefore, dislike it ”.

On the other hand, you will realise that what should be aimed at is translating into ordinal numbers the entire thought-content of the book—all its foci, all its criss-cross of subjects and forms and all its interlacings—fully and literally. Yes, fully and literally.

“Francis of Assissi is said to have ascended a mountain to formulate a more precise Rule for his Order. Then he wrote the Rule down, and gave it to his vicar, Elias. But Elias either lost the Rule, or secretly destroyed it, finding it too severe. So Francis ascended the mountain again. While he was meditating there, Elias and a group of brotheren appeared before him, to protest that they wanted no severe new Rule. Whereupon Francis appealed to his Holy Conscience, which, speaking in the air, affirmed that the Rule must be observed ‘literally, literally, literally, without gloss, without gloss, without gloss’.”

And so I say, not within the suppositious contexts of religion but within the personally actual contexts of library service : literally, literally, literally, fully, fully, fully. So classify, so serve, so exist : with your very best reasons. Any other reasons are not reasons, or no longer reasons—mere compulsions from without or mere glosses upon nightmares long ago ridden off the map of experience in the world of knowledge and of libraries—the states of total integration between books and humans—*Pustakālayās*.

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