Ranganathan, Shiyali Ramamrita.
Prolegomena to Library Classification. Assisted by M.A. Gopinath. 3rd edition.
Asia Publishing House, 1967.

This is a title in the dLIST Classics Project

dLIST Editor-in-chief: Anita Coleman

Digitization: Joy Wilcox, SIRLS, University of Arizona, Tucson.
Digitized: Fall 2006

Acknowledgments: SRELS Foundation (A. Neelameghan, K.N. Prasad, K.S. Raghavan, DRTC) and dLIST Advisory Board Member, S. Arunachalam (MS Swaminathan Research Foundation)

dLIST Classics by S.R.Ranganathan:

Five Laws of Library Science, Ed. 1 (1931)
Philosophy of Library Classification, (1973)
Prologemena to Library Classification, Ed. 3, (1967)
Classification and Communication, (1951)
Documentation Genesis and Development, (1973)
Documentation and its Facets, (1963)
Library Book Selection, Ed. 2, (1966)
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Other dLIST Classics

S.R. Ranganathan's Postulates and Normative Principles: Applications in Specialized Databases Design, Indexing, and Retrieval, 1997. Compiled by A. Neelameghan
Memorablia Ranganathan: A compilation of useful quotations of S.R. Ranganthan from his various works, 1994.
Putting Knowledge to Work: An American View of the Five Laws of Library Science, 1970, Pauline Atherton.

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PART E

CANONS FOR WORK IN THE IDEA PLANE

CHAPTER EA

CANONS FOR IDEA PLANE

1 Scope of Part E

This Part is devoted to the Canons regulating the work in the Idea Plane in designing a scheme for classification. A scheme for classification implies the prior concept of a Scheme of Classes. As stated in Sec CM1, a Scheme of Classes involves the following five inherent concepts:—

1 Characteristics;
2 Succession of characteristics;
3 Array of classes;
4 Chain of classes; and
5 Filiatory sequence.

All these concepts belong essentially to the Idea Plane.

2 Five Sets of Canons

Accordingly, this Part explains the following five sets of canons:—

1 Canons for characteristics;
2 Canons for succession of characteristics;
3 Canons for array;
4 Canons for chain; and
5 Canons for filiatory sequence.

3 Distribution Among Chapters

The explanation of the above-mentioned five sets of canons is distributed respectively over the following five groups of chapters:—

1 Chapters EB to EF;
2 Chapters EG to EK;
3 Chapters EL to EQ;
4 Chapters ER to ET; and
5 Chapter EU.

CHAPTER EB

CANONS FOR CHARACTERISTIC

1 Four Canons

Each characteristic of an associated scheme of characteristics should satisfy the following four canons:—

1 Canon of Differentiation;
2 Canon of Relevance;
3 Canon of Ascertainability; and
4 Canon of Permanence.

These are common sense canons; no scheme for classification worth considering will violate them.

2 Distribution among Chapters

The above-mentioned four canons are explained, respectively, in the following four chapters:—

1 EC Differentiation
2 ED Relevance
3 EE Ascertainability
4 EF Permanence

3 Area of Applicability

All the above-mentioned four canons are applicable to the classification of any universe of entities. In particular, they are applicable to the Universe of Basic Subjects, the Universe of Isolate Ideas, the Universe of Compound Subjects, and the Universe of Complex Subjects, defined in Sec CR3.

CHAPTER EC

DIFFERENTIATION

1 Canon of Differentiation

A characteristic used as the basis for the classification of a universe should differentiate some of its entities—that is, it should give rise at least to two classes or ranked isolates.

2 Universe of Men

In the universe of Men, the characteristic "height" differentiates; but the characteristic "possession of face" does not.

3 Universe of Diesel Engines

In the universe of Diesel engines, the characteristics "number of cylinders" and "arrangement of cylinders" differentiate; but the characteristics "possession of cylinder" or "possession of combustion chamber" do not.

CHAPTER ED

RELEVANCE

1 Canon of Relevance

A characteristic used as the basis for the classification of a universe should be relevant to the purpose of the classification.

2 Universe of Boys

Let us take the universe of the boys in a class-room.

1 Let the purpose of classification be to divide the boys into convenient graded groups for tutorial work. Then mother tongue, intelligence, and extent of knowledge may be relevant characteristics; but height, colour, handwriting, physical strength, wealth, mode of dressing hair, and clothes are not.

2 Let the purpose of classification be to divide the boys into convenient graded groups for physical games. Then height, physical strength, and age may be relevant characteristics; but colour, extent of knowledge, handwriting, ancestry, wealth, and mode of dressing hair are not.

3 Let the purpose of classification be to divide the boys into convenient graded groups for answering matrimonial queries from outside. Then mother tongue, horoscope, ancestry, wealth, age, and colour may be relevant characteristics, but handwriting, mode of dressing hair, and kind of clothing are not.

3 Universe of Books

Let us take the universe of books.

1 Let the purpose of classification be to suit the needs of binders. Then thread and tape used for stitching, style of stitching, boards used, covering material, and tooling are relevant characteristics.

2 Let the purpose of classification be to suit the needs of printers. Then typography, leading, margin, illustrations, and paper are relevant characteristics.

3 Let the purpose of classification be to suit the needs of the readers in a library. Then subject, language, author, and year of publication are relevant characteristics.

4 Too Many Relevant Characteristics

The characteristics relevant to the purpose of classification are usually many. Practical considerations, however, will restrict us to the inclusion of only a few of them in the Associated Scheme of Characteristics. Further, it may also happen that the scheme for classification becomes as efficient as it can be even without the

need to use all the relevant characteristics allowed by practical considerations. If then there is need for a selection of only a few of the possible relevant characteristics, it follows that we can construct different schemes of characteristics, and that they may produce different Associated Schemes for Classification for one and the same universe. All these Schemes for Classification may not be equally helpful to the purpose in view.

5 Genius and Flair

This naturally raises the question, "How to make a selection of just those relevant characteristics for the construction of the Associated Scheme for Characteristics that is likely to give us the most helpful Scheme for Classification?" There is yet no definite answer to this question. No *a priori* rules for hitting upon the most helpful set of characteristics have been found as yet. Generally it depends on genius; but, other things being equal, persons with knowledge and experience are likely to develop the flair to reject the less helpful characteristics.

CHAPTER EE

ASCERTAINABILITY

1 Canon of Ascertainability

A characteristic used as the basis for the classification of a universe should be definite and ascertainable.

A universe of entities may have many relevant characteristics. But all of them may not be ascertainable. This Canon emphasises that only the characteristics which are ascertainable should be chosen for the division of the universe of entities.

2 Example 1. Date of Death

The date of death is a characteristic of the persons in a group, as there is next to no probability that *all* the persons will die on the same day. But it may not be definitely and reliably ascertainable, even with the aid of astrologers and palmists.

3 Example 2. Date of Birth

In the universe of poets, the year of birth is ascertainable and is, therefore, eligible for use as the basis of its classification.

CHAPTER EF

PERMANENCE

1 Canon of Permanence

A characteristic used as the basis for the classification of a universe should continue to be unchanged so long as there is no change in the purpose of classification.

2 Chameleons

1 Imagine the result of using colour as a characteristic for classifying chameleons!

2 We often experience a similar difficulty in classifying politicians by their political complexion!

3 Periodicals

In some schemes for classification, periodicals are divided into the two classes:

1 Those published by learned societies; and

2 Those not published by learned societies.

This has led to not a little difficulty in libraries. As has been fully discussed in my *Classified catalogue code*, periodicals undergo frequent changes in the authority or agency publishing them [104].

31 MEDICAL LIBRARY

For instance, the periodical *Medical library*, which had been running its course from 1883 without a learned "godfather" was taken over in 1890 as its official organ by the American Electrotherapeutic Association just then founded. In 1926, it took as a joint foster-father the International Association of Climatologists.

32 JOURNAL OF INDIAN BOTANY

Here is another example, from India. The *Journal of Indian botany* was launched as a private concern in Madras in September 1919. It was the property of a private individual, Mr T R D Bell, then Chief Conservator of Forests, Bombay. In 1920, the Indian Botanical Society came into existence, and, at a meeting held on 3 February 1922, it decided to take over the *Journal* as the property and official organ of the Society. Accordingly, with the second issue of Volume 3, this *Journal* became the official organ of that learned body.

33 PHYSICAL REVIEW

Here is a third example from the universe of periodicals in

Physics. The following extract from the first page of the first volume of the second series of the *Physical review* will make clear how the characteristic under consideration underwent a change in January 1913: "With the present number the American Physical Society takes over the *Physical review*. . . . In so doing the Society wishes to give expression to its deep appreciation of the great service done to physics and physicists in America by the editors who in July-August 1893 put forth the first number of a new Journal. . . . During nearly twenty years the original editors have carried on the arduous task of maintaining this journal on a high standard. . . . The former editors have now thought best to complete their task by transferring their control to the American Physical Society, and the *Physical review* now becomes the Journal of that Society".

34 Experience in Madras University

The Madras University had about 1,600 periodicals in 1930, and even then the difficulty caused by such cases of change of characteristic was pronounced. The library therefore decided to give up this characteristic of classification, and to put both kinds of periodicals in one and the same class.

4 Poetry

Here is another example from the universe of books, belonging to the category of poetry. Literary Form is one of the commonest characteristics used in the classification of literature. Poetry is, in fact, a form division of literature. Let us consider the further division of poetry on the basis of the same characteristic of form. Here is a typical pronouncement. With regard to poetry, form is used in ways not only divergent but also contradictory. And all the ways are in turn justifiable, as W P Ker puts it [75]. He adds [76] that in English poetry the forms change through different causes, and that form in poetry is often merely an aspect, something one takes for convenience of understanding and then lets go [77]. Opinion changes frequently regarding the forms of poetry, such as Lyric, Narrative, Ode, Elegy, Sonnet, Epic, and so on. Perhaps for this reason Wordsworth added to his own *Tintern Abbey* the note, "I have not ventured to call this Poem an Ode" [182]. Due to impermanence of opinion on the form characteristic, no attempt is made to classify poems into different sub-forms in most of the schemes for classification.

5 Classification of Territory

Classification of the territories in a continent or in a country on the basis of political and administrative divisions is notorious in violating this Canon from time to time.

51 PHYSIOGRAPHICAL FEATURE

Classification of the world as a whole and any territory will satisfy the Canon of Permanence if the characteristic used for classification is physiographical feature. This will generally yield classes such as Desert, Prairie, Forest, Cultivated Area, Coastland, Peninsula, Cape, Isthmus, Delta, Island, River, Valley, Plateau, Watershed, Mountain, Coastal Sea, Gulf, Strait, High Sea, and Land Sea. Literary warrant on such classes is not even a sizable fraction of that on classes based on political and administrative characteristics [57].

52 POLITICAL AND ADMINISTRATIVE CHARACTERISTICS

But the classes based on political and administrative characteristics change their coverage quite often. However, the Canon of Relevance insists on the classification of a territory being based on political and administrative characteristics.

53 INSOLUBLE PROBLEM

The problem arising out of this conflict between the Canon of Relevance and the Canon of Permanence is an unsolved problem in the classification of geographical areas. Probably, it will for ever continue to be insoluble. If we stick on to the outmoded findings of the historical geography of an earlier period, it is not at all helpful. If, on the other hand, we change the geographical divisions with every political and administrative change, as and when it comes, we shall be behaving like the old man, his ass, and his son, described in the fables. One way-out usually adopted is to have different schedules of geographical divisions for different epochs. Even this bristles with difficulties [58, 147].

CHAPTER EG

CANONS FOR SUCCESSION OF CHARACTERISTICS

1 Three Canons

The succession of characteristics in the associated scheme of characteristics should satisfy the following three canons:

1 Canon of Concomitance
2 Canon of Relevant Succession
3 Canon of Consistent Succession.

These are common sense canons; no scheme for classification worth considering will violate them.

2 Distribution among Chapters

The above-mentioned three Canons are explained, respectively, in the following three chapters:

1 EH Concomitance
2 EJ Relevant Succession
3 EK Consistent Succession.

3 Area of Applicability

All the above-mentioned three Canons are applicable to the classification of any universe of entities. In particular, they are applicable to the Universe of Basic Subjects, the Universe of Isolate Ideas, the Universe of Compound Subjects, and the Universe of Complex Subjects, defined in Sec CR3.

CHAPTER EH

CONCOMITANCE

1 Canon of Concomitance

No two characteristics in the associated scheme of characteristics should be concomitant—that is, they should not give rise to the same array of subjects or of isolate ideas.

2 Example

In the universe of men, age and year of birth should not be used as characteristics in succession, as the basis for classification; for they will both give rise to the same array. But the characteristics, height and age, can be used in succession, since they will give rise to two different sets of arrays.

CHAPTER EJ

RELEVANT SUCCESSION

1 Canon of Relevant Succession

The succession of the characteristics in the associated scheme of characteristics should be relevant to the purpose of the classification.

2 Universe of Boys

1 Take the problem of classifying the boys in a class-room for matrimonial purposes. Let us assume, for definiteness, that they are all Hindu boys. Then the following sequence of six characteristics may in general be considered relevant to the purpose: Mother tongue, ancestry, horoscope, wealth, age, and colour.

Suppose that the families with mother tongue B give more weight to wealth than to horoscope and more weight to horoscopes than to ancestry, and that in the mother tongue C colour is ignored but otherwise the same sequence as for B is preferred, then the relevant succession of characteristics will have to be as follows:

First Characteristic: Mother tongue.

Further Characteristics:

1 For mother tongues other than B and C, ancestry, horoscope, wealth, age, and colour.

2 For mother tongue B, wealth, horoscope, ancestry, age, and colour.

3 For mother tongue C, wealth, horoscope, ancestry, and age.

Then, for the families with different mother tongues, different successions of characteristics are needed.

3 Literature

31 Decimal Classification

In DC, Language, Form, and Period are the three characteristics used in classifying the universe of subects going with the Main Class Literature. There are six different successions in which these three characteristics can be used. But DC has rightly chosen the succession: Language, Form, and Period as most relevant to the purpose of the classification of books—which is the convenience of the readers.

32 Colon Classification

In CC, Language, Form, Author, and Work, are the four characteristics used in classifying the same universe of subjects. Out of the twenty-four different successions possible, CC has rightly

chosen the succession: Language, Form, Author, and Work as the most relevant. The implications of the choice in shelf arrangement are fully discussed in the *Colon classification* [106].

4 Chemistry

In CC, Substance and Problem are two of the characteristics used in classifying the Universe of Subjects going with the Main Class Chemistry. In Ed 1 (1933), the succession prescribed for these characteristics was: Problem, Substance. While doing reference service on floor duty, it was found that this succession did not give satisfaction to readers. In other words, it was not relevant to the purpose of the readers. Therefore, their succession was changed into Substance, Problem, in Ed 2 (1939).

5 Law

In CC, Community and Law 1 are two of the characteristics used in classifying the Universe of Subjects going with the Main Class Law. In Ed 1 (1933), the succession prescribed for these two characteristics was : Law 1, Community. This was due to the experience gained by observing the approach of the students of the Law College to the meagre collection of books on Law in the Madras University Library. These students had to study only Modern British Law and Modern Indian Law, which were not very different. Therefore, the community characteristic did not figure in their approach. However, when books on the Laws of other countries were added to the Library and Senior Lawyers began to use the Library, it was found that the succession relevant to their purpose was the opposite one. Therefore, the succession of the characteristics was changed into Community, Law 1, in Ed 2 (1939).

CHAPTER EK

CONSISTENT SUCCESSION

1 Canon of Consistent Succession

The succession of the characteristics in the associated scheme of characteristics should be consistently adhered to, so long as there is no change in the purpose of the classification.

2 Decimal Classification

For the universe of subjects going with the Main Class 'History', DC has chosen the Geographical and the Period characteristics as the only necessary ones. It has also decided their succession as "Geographical and then Period". Those who use DC should not change this decision from time to time; they should adhere to it consistently; otherwise chaos will result.

3 Colon Classification

For the same universe of subjects, CC has chosen four characteristics instead of two. They are Community, Organ of the State, Attribute of Organ, and the Period. In Rule V0 of CC, it has been decided that this is the most relevant succession. Those who use CC should adhere consistently to this decision on the succession of these four characteristics. Otherwise chaos will result.

(*Note*.—Isolate ideas—such as Policy, Constitution, Function, Relation with Special Social Groups, and Rights and Duties—described as "Problems" in Edition 7 of CC--are described here as "Attributes".)

CHAPTER EL

CANONS FOR ARRAY

0 Four Canons

Each array of classes in a scheme for classification should satisfy the following four canons:

1 Canon of Exhaustiveness
2 Canon of Exclusiveness
3 Canon of Helpful Sequence
4 Canon of Consistent Sequence.

2 Distribution among Chapters

The above-mentioned four canons are explained, respectively, in the following four chapters:

1 EM Exhaustiveness
2 EN Exclusiveness
3 EP Helpful Sequence
4 EQ Consistent Sequence.

3 Area of Applicability

All the above-mentioned four canons are applicable to the classification of any universe of entities. In particular, they are applicable to the Universe of Basic Subjects, the Isolate Ideas, the Universe of Compound Subjects, and the Universe of Complex Subjects, defined in Sec CR3.

CHAPTER EM

EXHAUSTIVENESS

1 Canon of Exhaustiveness

The classes in an array of classes, and the ranked isolates in an array of ranked isolates should be totally exhaustive of their respective common immediate universes.

In the rest of this chapter, any statement about classes is true also of ranked isolates.

Any new entity added to the original universe should be assigned in the process of classification to the immediate universe under consideration and should be assigned to any of the existing classes or to a newly formed class, as the case may be, in the array under consideration.

2 Universe of Numbers

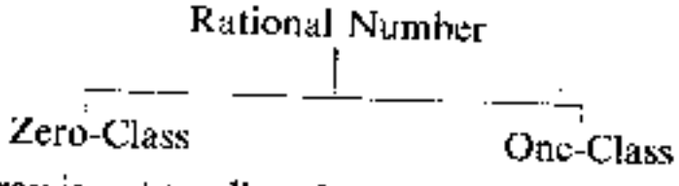
Consider the universe of integers. Use as characteristic the "remainder left by dividing a number by 2". Then the resulting array will have only the two classes:—

1 Class 1 consisting of the numbers giving zero as remainder – "Zero-Class"; and

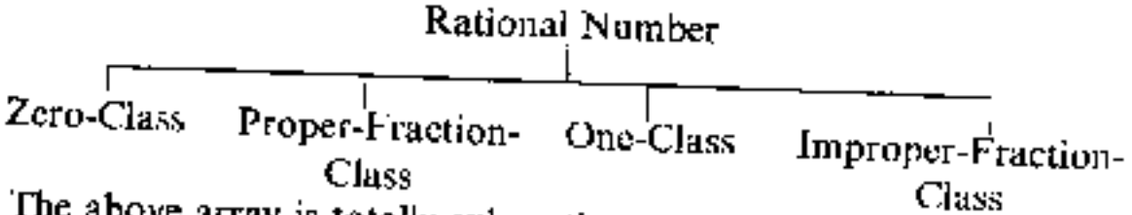
2 Class 2 consisting of numbers giving one as remainder – "One-Class".

These two classes in the array exhaust all the numbers in the immediate universe.

Let us introduce rational numbers into the immediate universe. When divided by 2, a rational number will give us the remainder, either a proper fraction or an improper fraction lying between 1 and 2. As a result, a rational number cannot be included in either of the two classes already provided in the array. Therefore, that array is not totally exhaustive of the new immediate universe. To make it totally exhaustive, we must introduce in the array at least one more class –"Fraction Class". It can also be done by introducing two classes in the array –viz, "Proper-Fraction-Class" and "Improper-Fraction-Class".



The above array is not totally exhaustive.



The above array is totally exhaustive.

3 Decimal Classification Edition 14

In Ed 14 of DC (1942), after enumerating 8 Functions of Local Government, the residual class "Other Topics" is added at the end to make the array totally exhaustive. The "Other-device" formally satisfies the Canon of Exhaustiveness. But classes included in it are left without being individualised. This device is resorted to because of the fetters placed in the idea plane by the rigidity of the notational plane allowing only a limited number of digits or digit-groups to number the classes in an array.

4 Decimal Classification Edition 17

In Ed 17 of DC (1965), however, this rigidity in the notational system was partly removed by recognising the eight digit-groups 91 to 98 as co-ordinate with the digits 1 to 8 and thus breaking the "Other Class" into eight different classes.

5 Colon Classification

CC has not fettered itself at all. It allows any number of classes to be enumerated in an array until the immediate universe is exhausted. Further, if new classes appear in the immediate universe, they can be interpolated or extrapolated in their respective proper places among the already enumerated classes (*See* Part L).

6 Bibliographic Classification

In BC, after enumerating four special kinds of libraries, the residual class "Other Special Kinds of Libraries" is added at the end.

7 Rider's International Classification

In RIC, after enumerating 27 religions, the residual class "Other Religions" is added at the end.

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CHAPTER EN

EXCLUSIVENESS

1 Canon of Exclusiveness

The classes in an array of classes and the ranked isolates in an array of ranked isolates should be mutually exclusive.

In the rest of this chapter, any statement about classes is true also of ranked isolates.

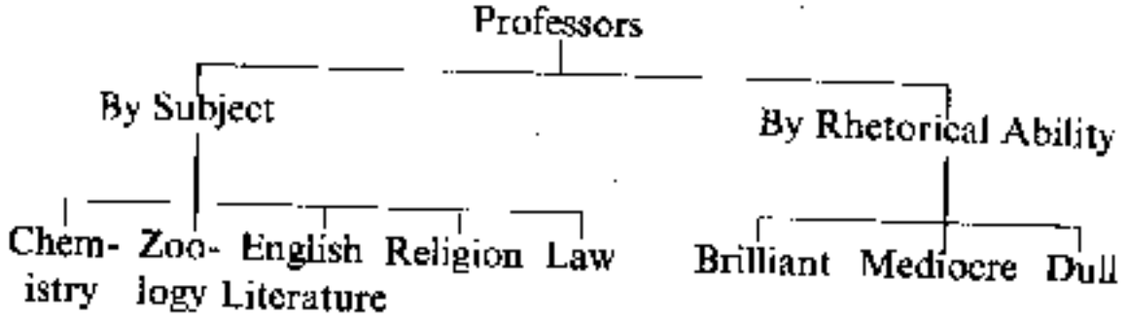
According to this Canon, no entity comprised in the immediate universe can belong to more than one class of the array. In other words, no two classes of the array can overlap or have an entity in common. To secure this, the classes of an array should be derived from its immediate universe on the basis of one and only one characteristic.

2 Universe of Professors

Faulty method of forming an array without adhering to a single characteristic is illustrated by dividing the Universe of Professors into the array comprising the classes "Chemists", "Zoologists", "English Literature Specialist", "Religion Specialist", and "Lawyers", etc, and "Dull lecturers", Mediocre lecturers", "Brilliant lecturers", etc. The earlier set of classes are formed by using their respective Subjects of Specialisation as the characteristic. The latter classes are formed on the basis of their respective Rhetorical Abilities as the characteristic. Obviously, each professor will fall into two classes of the array so formed, and thus the Canon will be violated.

3 Formation of Different Arrays

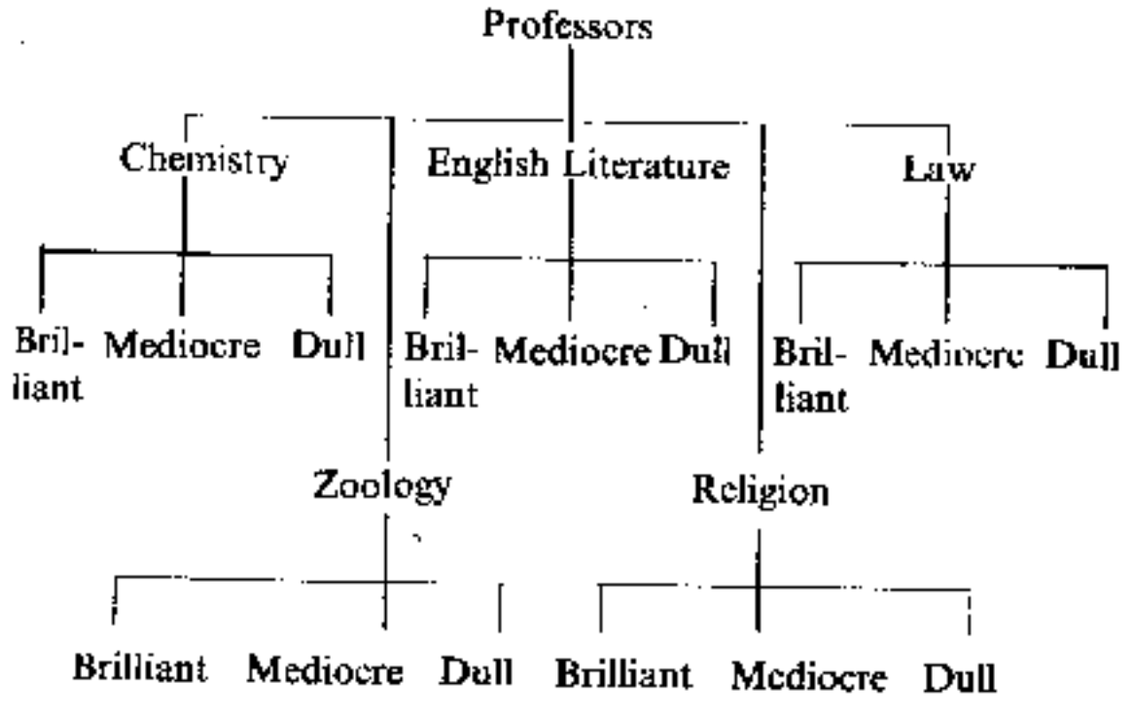
The only way out is to keep the following as two different arrays.



These two arrays should not be combined into a single array.

4 Formation by Succession of Characteristics

It is possible to arrange also as follows by using the two characteristics in succession.



5 Formation of a Single Array

The six arrays in the diagram of Sec EN4 can be coalesced together into a single array as shown in the next section. The Coalesced Array will have in it all the 23 classes in the diagram in Sec EN4. The Coalesced Array and the Original Universe may be represented as shown in the next page. For convenience of printing the diagram has been turned through a right angle.

6 Coalesced Array

Array formed by putting in succession in a single array the various arrays formed at any stage in the progressive classification, the succession of the arrays being such that the classes fall in filiatory sequence.

A Coalesced Array is the Scheme of Classes formed at the stage of the coalescence of the arrays (*See* Sec CL3).

All the classes at the stage of formation of the Coalesced Array will be included in it.

Professor
—Brilliant Professor
—Mediocre Professor
—Dull Professor
—Chemistry Professor
—Brilliant Chemistry Professor
—Mediocre Chemistry Professor
—Dull Chemistry Professor
—Zoology Professor
—Brilliant Zoology Professor
—Mediocre Zoology Professor
—Dull Zoology Professor
—English Professor
—Brilliant English Professor
—Mediocre English Professor
—Dull English Professor
—Religion Professor
—Brilliant Religion Professor
—Mediocre Religion Professor
—Dull Religion Professor
—Law Professor
—Brilliant Law Professor
—Mediocre Law Professor
—Dull Law Professor

CHAPTER EP

HELPFUL SEQUENCE

1 Canon of Helpful Sequence

The sequence of the classes in an array of classes, and of the ranked isolates in an array of ranked isolates, should be helpful to the purpose of those for whom it is intended.

This Canon should be observed not only in each array but also in any coalesced array.

2 Conflict of Purposes

We have seen in Chap ED that what is helpful to one purpose may not be helpful to another. In other words, helpfulness of sequence will vary with the users of the scheme for classification. This raises the following questions.

1 Should a different scheme for classification be designed to suit different users?

2 Is it proper to design a standard scheme for classification to suit the purpose of the largest number of users?

3 If so, is there any way of helping the minority groups of users in adapting the standard scheme to their respective purposes without altering the class numbers and isolate numbers in the standard scheme?

3 Answer of "International Use"

These are important questions. Convenience, and international use in particular, would suggest the answer 'No' to the first question and 'Yes' to the second. How the problem raised in question 3 can be met is indicated in Part U of this book.

4 Determination of Helpful Sequence

Whatever be the answer to the questions in Sec EP2, helpfulness of sequence in array—helpfulness to the majority of users—can be determined with the help of a few principles. These principles are discussed in Part F of this book.

CHAPTER EQ

CONSISTENT SEQUENCE

1 Canon of Consistent Sequence

Whenever similar classes or ranked isolates occur in different arrays, their sequence should be parallel in all such arrays, wherever insistence on such a parallelism does not run counter to other more important requirements.

Conformity to this Canon will be conducive to economy of time and of attention and of mental energy. It will minimise the load on the memory both for the classifier and for the user. It is responsible for certain practices and devices and in some of the schemes for classification.

2 Means of Securing Consistent Sequence

There are two ways in which consistent sequence can be secured.

1 Automatic Conformity by using one and the same schedule to form an array in whatever subject it occurs. This may be either with the aid of schedules of common isolates (that is, subdivision) or some other devices; and

2 Maintenance of parallel sequence with the help of some Principles for Helpful Sequence (*See* Part F).

3 Automatic Conformity

31 Decimal Classification

In Ed 17 of DC (1965), automatic conformity to the Canon of Consistent Sequence is secured by providing,

1 Table of standard subdivisions giving a schedule of certain common isolates;

2 Area table giving a schedule of geographical isolates; and

3 "Divide Like" Device, meaning thereby "Divide Like the secondary sequence to the extent that is appropriate to the heading, definition, and scope governing the primary sequence" [37]. The following are some examples of "Divide Like" Device:

1 016 Bibliographies of Specific Subjects. Divide Like 001-999. Example: Bibliographies of Mathematics 016.51 and Bibliographies of newspapers in England 016.072

2 301.451 Sociology of Ethnic groups. Divide like 420-490. Example: Negroes 301.451 96

3 641.331 Foods derived from cereal crops. Divide like 633.1. Example: Rice 641.331 8

32 EXPANSIVE CLASSIFICATION

In EC, automatic conformity to the Canon of Consistent Sequence is secured by providing the following two auxiliary tables.

1 Local list giving a schedule of geographical isolates; and

2 Table of Common subdivisions giving a schedule of certain common isolates.

33 UNIVERSAL DECIMAL CLASSIFICATION

In UDC, automatic conformity to the Canon of Consistent Sequence is secured by Tables of Auxiliaries, giving schedules of several kinds of common isolates, such as, form, point of view, geographical, chronological, and language isolates.

34 LIBRARY OF CONGRESS CLASSIFICATION

In LC, there is no provision for automatic conformity to the Canon of Consistent Sequence. In fact, this Canon is seldom respected.

35 SUBJECT CLASSIFICATION

In SC, automatic conformity to the Canon of Consistent Sequence is secured by the provision of a Categorical Table. Introducing this concept, Duff Brown, the designer of the scheme says, "In the absence of a more expressive portmanteau word, 'Categorical' is used to denote a table of forms, phases, standpoints, qualifications, etc, which apply more or less to every subject or subdivision of a subject. It was thought unwise to lead the Classification Tables themselves with repetitions of such categories" [28].

36 COLON CLASSIFICATION

In CC, automatic conformity to the Canon of Consistent Sequence is secured by

1 Schedules of common isolates such as Anteriorising Common Isolates, Time Isolates, Space Isolates, Language Isolates, Energy Common Isolates, and Personality Common Isolates (*See* Chap CS and RR); and

2 The use of Devices such as Chronological Device, Geographical Device, Subject Device, Alphabetical Device, Enumeration Device (*See* Part N), and also Facet, Phase, and Superimposition Devices (*See* Chap PE, PF, RB, SA, SD, and SF).

37 BIBLIOGRAPHIC CLASSIFICATION

BC secures automatic conformity to the Canon of Consistent Sequence with the aid of its Auxiliary Schedules. To a limited extent, this is equivalent to the use of the Facet Device in CC. But BC has been slowly increasing the number of these schedules—

that is, increasing the scope for Facet Device. In Ed 1 (1935), Bliss began, in effect, with fifteen schedules, but the fuller edition in four volumes, completed in 1953, states the position as follows: "The number of systematic schedules has been increased to twenty-one, and to these twenty-four adaptations are supplementary, making the total forty-five. Of these, only four are of general applicability, the others being for special classes or subjects or groups of these, and distinguished as Special Auxiliary Schedules" [11].

Example

Under the class "HRL Digestive System, Diseases, and Disorders", the following note appears:

"Schedule 13 may be for certain specifications of this subject, but the composite notation then suffixed should be pointed off by the comma to indicate the mnemonic notation and to avoid confusion with the special subdivisions that follow here".

The Schedule 13 gives 24 groups of common isolates applicable to any special disease or disorder. As a result of this note the problem divisions of many of the diseases are automatically arranged in parallel sequences.

38 RIDER'S INTERNATIONAL CLASSIFICATION

In RIC, there is no provision for automatic conformity to Canon of Consistent Sequence.

4 Parallel Sequence in Different Arrays

The parallel sequence in different arrays is secured with the help of the Principles for Helpful Sequence (*See* Part F). In CC, these principles are applied consciously. In other schemes the sequence of isolates or subjects, as the case may be, conform to these principles though in some cases, perhaps, unconsciously.

41 DECIMAL CLASSIFICATION AND UNIVERSAL DECIMAL CLASSIFICATION

1 Here is one set of parallels from DC:

In Medicine	In Psychology
Eye	Vision
Ear	Hearing
Organs of smell	Smell
Organs of taste	Taste
Organs of touch	Touch

2 Here is another set of parallels:

In Physics	In Chemistry	In Therapeutics
Light	Photo-chemistry	Light
Heat	Thermo-chemistry	Heat

Electricity	Electro-chemistry	Electro-therapeutics
Magnetism	Magneto-chemistry	
	Radio-chemistry	Radio-therapy

42 LIBRARY OF CONGRESS CLASSIFICATION

In LC, there is no parallel sequence in different arrays.

43 COLON CLASSIFICATION

The following are sets of parallel sequence in CC:

Example I

In Psychology: Array formed on the basis of Entity characteristic	In Education: Array formed on the basis of Educand characteristic	In Sociology: Arry formed on the basis of Group characteristic
Child	Pre-secondary	Groups arising from age and sex
Newborn		
Toddler	Pre-school	
Infant	Elementary	Child
Pre-adolescent	Secondary	Youth
Adolescent	Adult	Old Person
Post-adolescent	Literate	Woman
Middle age	Foreigner	Family
Old age	Illiterate	Groups arising from residence
Vocational	University	Groups arising from occupations
Sex	Sex	Groups arising from birth or status
Male	Male	
Female	Female	
Abnormal	Abnormal	Abnormal
Genius	(To be divided as in Psychology)	(To be divided as in Psychology)
Subnormal		
Insane		
Sick and Infirm		
Criminal		
Deaf and Dumb		
Blind		
Race	Backward classes	Race as a social group
Social		Groups arising from association
Other	Other	Other
(To be divided by	(To be divided by	(To be divided by

In Psychology: Array formed on the basis of Entity characteristic	In Education: Array formed on the basis of Educand characteristic	In Sociology: Array formed on the basis of Group characteristic
the Subject Device)	the Subject Device)	the Subject Device)

Example 2

In each of the Natural Sciences and in Medicine: (Problem divisions)	Morphology	Physiology	Diseases
In Philology: (Problem divisions)	Structure, Morphology	Function Syntax	
In Politics: (Problem divisions)	Parts of Government	Functions of Government	
In Sociology: (Problem divisions)		Activities	Social Pathology

Example 3

In Mathematics	Dynamics	Hydro-dynamics	Aero-dynamics
In Physics	Solids	Liquids	Gases
In Civil Engineering	Land transport	Water transport	Air transport
In Mechanical Engineering	Principles of Mechanism	Hydraulic Engineering	Pneumatic Engineering
In Dynamic Geology	Glacial Geology	Action of water	Action of air
In Ecology (Physiographic region)	Land	Water	Air
In Sports and Games	Athletics	Aquatic sports	Air sports
In Geography	Geomorphology	Oceanography	Meteorology
In History	Military history	Naval history	Aerial history
In Economics	Land transport	Water transport	Air transport
In International Law (Laws of war) etc	Invasion,	Maritime warfare	Air warfare

Three more examples of parallel sequence are given in Sec KC2.

44 Rider's International Classification

The following are sets of parallel sequence in RIC:

SN	Subject	Sequence of isolates in		
1	Space Schedule	In History	In Law	In Agriculture
		America	America	America
		Europe	Europe	Europe
		Africa	Africa	Africa
		Asia	Asia	Asia
		Australia	Australia	Australia
2	Approach materials (Reference)	In Physics (Solids)		In Agriculture
		Cyclopaedia		Cyclopaedia
		Periodicals		Periodicals
		Bibliography		Bibliography
		Research		Research

5 Violation of Parallel Sequence in Different Arrays

51 Decimal Classification

The following is an example of violation of parallel sequence in DC

In Medicine	In Zoology	In Botany
Head	Head	Stem
Neck	Neck	
Thorax	Thorax	Leaves and Frond
Abdomen	Abdomen	Root
Upper limbs	Tail	
Lower limbs	Extremities	

52 Library of Congress Classification

LC is quite indifferent to the Canon of Consistent Sequence, as the following examples show.

Example

1 In "Palaeontology", the countries of continental Europe are arranged strictly by the alphabet.

2 But in several classes of "Natural History", "Botany", and "Zoology", some of the countries of continental Europe are grouped and the groups are alphabetised, with the result that Holland, Belgium, and Luxembourg are placed under N, Netherlands, Poland, and Finland are placed with R under Russia and so on.

3 Here is another whimsical variation. Under "Fauna", Holland precedes Belgium, but under "Flora" Holland succeeds Belgium.

Again, the countries of Africa are arranged alphabetically under "Fauna", but are grouped under "Flora" with the result that Natal, Transvaal, East Africa, Nigeria, and Uganda come with B under British Africa. Abyssinia comes before British Africa, but West Africa comes before Abyssinia, and so on.

4 In "History of Printing", the continents are arranged in the sequence: Europe, Asia, Africa, America, Australia, and Great Britain comes after Germany among the subdivisions of Europe.

5 But in "History of Copyright Laws" all the countries of the world are arranged in one alphabetical sequence.

6 On the other hand, under "Bibliography in Botany" the countries of the world and the names of the continents, including oceanic areas such as Arctic Regions, are merged in one alphabetical sequence.

7 The geographical array prescribed for arranging "Library reports" lays down yet another sequence, giving the first place to the United States, and giving Great Britain precedence over Australia, in a sequence otherwise alphabetical by countries.

8 An altogether different sequence is prescribed for the geographical isolates under the sub-class "Lighthouse Service" in the class "Naval Sciences"; it is as follows: Europe, Great Britain, Norway, Denmark, Sweden, Russia, Germany ... Africa ... Asia ... Australia ... South America.

9 We find the following different sequences:

In the schedule of "Fine Arts"	In the schedule of "Bibliography by subjects"
Architecture	Architecture
Sculpture	Engraving
Drawing	Painting
Painting	Sculpture
Engraving	Decoration and ornament
Decoration and ornament	Drawing

10 In most subject, *Exhibitions and museums* come after *Study and teaching* and *Laboratories*, very near the end of the common subdivisions. But in "Chemistry" and "Sculpture" they come very near the beginning—immediately after *Periodicals*, in the former, and one place later, that is, after *Congress*, in the latter—while in the subject "Engraving" it comes still later, after *Dictionaries* and *Directories*. A more meaningless variation is that of *Museums* preceding *Exhibitions* in some subjects, like "Fine Arts (General)", while the sequence is the reverse in other subjects, like "Sculpture", "Graphic Arts", and "Chemistry".

11 In "Fine Arts (General)", *Directories* comes about the middle, and occurs between *Biography* and *History*. But in "Engraving" it comes much earlier, immediately after *Yearbooks* and *Dictionaries*, while *History* and *Biography* come several places later. On the other hand, a place near the end is found for *Directories*, after *History* and *Biography*, in "Science (General)" and "Geology".

12 *Yearbooks* is usually given the second place. But in "Geology" it is taken a long way down and is put together with *Directories*.

13 *History* and *Biography* are separated by *Directories* in "Fine Arts (General)". But in most other subjects they are put consecutively. Again, *History* comes before *Biography* in "Sculpture", "Engraving", and in most of the "Natural Sciences". But Biography comes before History in "Fine Arts (General)", "Graphic Arts", and "Painting".

14 *Nomenclature* comes at the very end in "Anatomy", very early in "Botany" "Geology", and "Chemistry", but somewhere in the middle in "Science (General)".

15 *Studies and teaching* usually comes immediately after *Essays* and *Lectures* and about two-thirds of the way down in the array of common subdivisions. But it comes last, and is separated from *Essays* and *Lectures* by many divisions, in "Physics". In "Anatomy", "Botany", and "Zoology", on the other hand, *Studies and teaching* retains its usual place two-thirds of the way down the array, but *Essays* and *Lectures* comes last.

16 *Study and teaching* comes after History in most subjects, but many classes before *History* in "Decoration and ornaments".

17 *General works* usually comes immediately before *Study and teaching* in most of the subjects, and is about two-thirds of the way down the array. But in "Decoration and Ornaments" *General works* comes near the end of the array, and *Study and teaching* occurs somewhere in the middle.

18 *Essays* and *Lectures* usually comes near *General works*, about two-thirds of the way down the array. But in "Botany" it comes almost near the end of the array.

The illustrations of the plethora of inconsistency can be continued to any extent. It is not clear what purpose is served by arranging the geographical isolates in so many ways, ruthlessly flouting the Canon of Consistent Sequence, conformity to which would have considerably shortened the bulk of the schedule, would have relieved classifiers a good deal of unnecessary strain in their daily work, and would cause less irritation to readers in whom curiosity is not altogether dead (*See also* Sec KC42).

53 BIBLIOGRAPHIC CLASSIFICATION

The following is an example of violation of parallel sequence in

different arrays in BC.

In Medicine	In Botany
Head	Root
Neck	Stem
Chest	Leaf
Abdomen	Flower
Pelvis	Fruit
Upper extremity	
Lower extremity	

See also Sec FD21 and FD22.

54 RIDER'S INTERNATIONAL CLASSIFICATION

The following is an example of violation of parallel sequence in different arrays in RIC.

In Linguistics	In Literature
European	European
Hebrew	Arabic
Persian	Persian
Arabic	Hebrew
Turkish	Turkish
Hindusthani	Hindusthani
Chinese	Chinese
Japanese	Japanese

CHAPTER ER

CANONS FOR CHAIN

1 Two Canons

Each chain of classes or of ranked isolates in a scheme for classification should satisfy the following two canons:

1 Canon of Decreasing Extension
2 Canon of Modulation

2 Distribution among Chapters

The above-mentioned two Canons are explained in the following two chapters:

1 ES Decreasing Extension
2 ET Modulation

3 Area of Applicability

The above-mentioned two canons are applicable to the classification of any universe of entities. In particular, they are applicable to Universe of Basic Subjects, Universe of Isolate Ideas, the Universe of Compound Subjects, and the Universe of Complex Subjects, defined in Sec CR3.

CHAPTER ES

DECREASING EXTENSION

1 Canon of Decreasing Extension

While moving down a chain from its first link to its last, the extension of the classes or of the ranked isolates, as the case may be, should decrease and the intension should increase at each step.

2 'Extension' and 'Intension'

The terms 'Extension' and 'Intension' require elucidation. Much controversy exists in logic about their proper use and the inverse relation between them, implied in the Canon of Decreasing Extension. But as applied to a chain of classes or of ranked isolates in a Scheme for Classification as defined in Chap CF, they can be determined without involving ourselves in this controversy.

3 A Rough Measure

We may say that the Extension has for its measure the number of entities or of the range comprised in the class or in the ranked isolate; while its Intension has for its measure the number of characteristics used in deriving it from the original universe. This measure is the same as the order of the class of the ranked isolate.

4 Quantitative and Qualitative Measure

In a certain sense its Extension is a quantitative measure of a class or of a ranked isolate. Its Intension is a qualititative one.

5 Elucidation by Sayers

Sayers elucidates the matter as follows [162]. A main class covers a wide field—a great number of things. Its compass is its *extension*. *Intension*, on the other hand, signifies meaning: the broader the class, the fewer are the attributes that can be predicated of it; or the greater the extension, the smaller will be the intension. Philosophy has great extension; Ethics, which is a division of Philosophy, is of less extension but of very much greater intension. Sobriety, which is a division of Ethics, is of much less extension but of much greater intension; Abstinence has still further reduced extension and increased intension. Classification moves according to this method.

6 Example

SN	Chain	Remarks
1	Substances (in Chemistry) Inorganic Substances Elements Halogens Chlorine	The number of entities comprised in each ranked isolate decreases and the number of characteristics used to derive it from the original universe Substance increases, as we go down the chain and reach the ranked isolate Chlorine.
2	Asia India Madras State Tanjavur District Srikali Taluk	The extent—that is, the area—comprised in the ranked isolate decreases and its order increases, as we progress from the ranked isolate Asia to the ranked isolate Srikali Taluk.

7 When Applicable

It may be emphasised here that the Canon of Decreasing Extension is applicable only to the classes or the ranked isolates in one and the same chain, that is, to those with lineal kinship, and not to any other set. Obviously, it would be ridiculous to compare, in respect of relative extension, such different classes as Democracy and Steam Engine, going with different main classes. It is equally without meaning to compare the classes or the ranked isolates which, though belonging to the same original universe occur in different chains originating from it (*See also* Chap LF).

8 Example

Consider the two following chains originating from the same class "Animals" in the main class "Zoology".

Animals	Animals
Invertebrates	Vertebrates
Worms	Birds

Worms and birds both belong to the ranked isolate "Animals", but are not subordinate one to the other—that is, they do not occur in the same chain. Therefore, their extensions cannot be compared.

CHAPTER ET

MODULATION

1 Canon of Modulation

A chain of classes or of ranked isolates should comprise one class or one ranked isolate, as the case may be, of each and every order that lies between the orders of the first link and the last link of the Chain.

2 Alternative Formulaiion

This Canon admits of an alternative formulation in terms of the concept "Resolving Power". This concept was suggested by S Ramabhadran, in a morning walk in Delhi, while I was explaining the nebulousness and the element of indeterminateness involved in the Canon of Modulation.

21 Resolving Power

Power of recognising the classes or the ranked isolates appropriate to the array of the first order of an immediate universe.

A chain of classes or of ranked isolates should be derived from the immediate universe with the use of the lowest resolving power at each stage of division.

3 Nebulousness

The Canon of Modulation needs further investigation. There is something indeterminate about it. It implies a certain necessary set of links in a chain; and this unexpressed implication is responsible for a great deal of difficulty. Ultimately, modulation appears to depend on the

1 Relevant characteristics allowed; and

2 Sequence of the application of these characteristics.

Thus the concept is severely relative. There is hardly anything absolute about it. And, yet, in spite of difficulties in unexplored regions at great depths, the Canon may not be difficult to apply in most of the ordinary contexts.

31 Example

1 To take the first example given in Sec ES6, "Substances in Chemistry" is the first link and "Chlorine" is the last link of the chain. "Substances" is a ranked isolate of order zero and "Chlorine" is that of order four. According to the Canon of Modulation, a scheme for classification would be defective, if the chain omitted to give either "Inorganic substances", or "Elements", or "Halo-

gens". There are the ranked isolates of the intermediate orders—one, two, and three respectively—of the chain under consideration.

2 Again, if we take the second example given in Sec ES6, "Asia" is the first link and "Srikali Taluk" is the last link of the chain. "Asia" is a ranked isolate of order zero, and "Srikali Taluk" is that of order four. According to the Canon of Modulation, a scheme for classification would be defective if the chain omitted to give either "India", or "Madras State", or "Tanjavur District". These are the ranked isolates of the intermediate orders—one, two, and three respectively—of the chain under consideration.

4 Violation of Canon of Modulation

In 1957, A J Wells, Editor of the *British national bibliography*, said as follows:

"The structure of the DC Number (by implication, the schedule also) frequently omitted the steps in the hierarchy. The missing links had to be discovered and inserted. Here is an example. In the main class "Religion" we fail to provide a class index entry for "Christianity", because this link nowhere appears though it is implied in the sub-classes 220 and 280. In order that a class index entry for "Christianity" should be made whenever a subject falling in one of the classes 220 to 280 arose, we had to insert the generic class "Christianity" giving it the number 220/280. Here are other examples of such improvisation: when we get the subject "River Engineering" which has the DC Number 627.1 we find that the link "Hydraulic Engineering" is missing and we have to improvise the generic class "Hydraulic Engineering" giving it the number 626/627. We have the DC Number 621.31344 for "Synchronous Motors", but no DC Number for "Motors in General". We have therefore to improvise this class giving it the number "621.313[1]-Motor" [181].

41 Missing Link "Christianity"

Up to and including Ed 14 of DC (1942), there was no class number to represent the class "Christianity". Ed 16 (1958) gives the caption "220-289 Christian Religion". Ed 17 (1965) gives the caption "220-280 Christian Religion". But this cannot be used as class number because the ordinal value of "-" (hyphen) is not defined, though it can be used in the catalogue as the inclusive class number for the subject-heading "Christianity"

42 Missing Link "Hydraulic Engineering"

Up to and including Ed 14 of DC (1942), there was no class number to represent the class "Hydraulic Engineering". In Ed 16

(1958) and Ed 17 (1965), the following class numbers are given:

Ed 16 of DC

627 Hydraulic Engineering

627.12 Rivers and Lake Engineering

Ed 17 of DC

627 Hydraulic Engineering and Construction Works

627.12 Rivers

43 MISSING LINK "MOTORS IN GENERAL"

Up to and including Ed 14 of DC (1942), there was no class number to represent the class "Motors in General". Nor is it included in the schedules of Ed 16 (1958) or Ed 17 (1965). However, in the index of Ed 17 (1965), the term 'Motors' is referred to the class number

621.313 Dynamo-electric (generating) machinery.

CHAPTER EU

CANONS FOR FILIATORY SEQUENCE

0 Two Canons

Filiatory Sequence calls for the following Canons.

1 Subordinate Classes

2 Coordinate Classes.

1 Canon for Subordinate Classes

In a coalesced array (*See* Sec EN5), if A_1, A_2, A_3, etc are subclasses of any order whatever of class A, originated in one or another of the chains originating from the class A, the classes A_1, A_2, A_3, etc should immediately follow the class A in succession, without being separated from it or among themselves by any other class.

This Canon has been illustrated in the diagram facing Chap CA and by the analogy of the Siddha Family described in Chap CJ.

2 Canon for Coordinate Classes

In a coalesced array (*See* Sec EN5), if class A and class B had originated in one and the same array and had been consecutive in it, they should not be separated from each other by any class other than the classes A_1, A_2, A_3, etc having A as their common immediate universe.

3 Annotation

The way in which the coalesced array should be formed is described in Sec EN25. Such a coalesced array satisfies both of the Canons for Filiatory Sequence.

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Asia Publishing House, 1967.

This is a title in the dLIST Classics Project

dLIST Editor-in-chief: Anita Coleman

Digitization: Joy Wilcox, SIRLS, University of Arizona, Tucson.
Digitized: Fall 2006

Acknowledgments: SRELS Foundation (A. Neelameghan, K.N. Prasad, K.S. Raghavan, DRTC) and dLIST Advisory Board Member, S. Arunachalam (MS Swaminathan Research Foundation)

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