LIBRARY CLASSIFICATION THROUGH A CENTURY*

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After defining the terms 'Scheme of Classes', 'Scheme of Classification' and 'Library Classification', the progress in the First Century of the Classification Era is traced in the three major periods: Pre-Facet, Transition-to-Facet and Facet Periods. The Facet Period is divided into the Restricted Facet Formula period, the Generalised Facet Formula Period and the Two Relativity Periods-viz Dorking and Elsinore Periods. For each of the six resulting periods, the chief achievements in library classification and the social factors leading to them are mentioned. The achievements of the Dorking Period just ending are described in greater detail. Then follows the programme of research work for the Elsinore Period of 1965 to 1975. A programme for Fundamental Research in the Idea, Verbal, and Notational Planes is chalked out. Then follows the programme for Routine research in the building of schedules of Common Isolates, which is a back log from the Dorking Period, and the new area of the Design and the Building of Schedules for the Depth Classification of diverse subjects, needed for Documentation Work and Service. Lastly, the organization suitable to carry out the programme is outlined.

0   UNIVERSE OF DISCOURSE

The theme of the address is "Library Classification Through a Century". It is best to begin with fixing the boundary of this universe. We shall have to fix it in respect of the two substantive terms 'Library Classification' and 'Centrury'.

CLASSIFICATION

We shall start with the concept denoted by the term 'Classification'. Classification can be of:

1. Concrete materials;
2. Percepts-that is, facts of sensory experience;
3. Facts as recorded in Meta Documents-that is, direct instrument records of natural and social phenomena unmediated by human mind;
4. Concepts-that is, facts of intellectual experience;
5. Concrete concepts-that is, concepts having concrete materials outside the mind as their correlates;
6. Abstract concepts-that is, concepts not having concrete materials outside the mind as their correlates;
7. Mystic and spiritual experience-that is, trans-intellectual experience; and
8. Combinations of any of these.

Stated generally, the term 'Classification' can be taken in relation to any Existent-concrete or conceptual. Of the eight groups of existents, the first- viz oncrete materials-satands quite apart from the next six. We shall use the generic term 'Knowledge' to denote these six groups. We can then distinguish between materials Classification and Knowledge Classification. The two are of course closely related. However, they are distinct.

We shall restrict our universe of discourse to Knowledge Classification.

Scheme of Classes

1.1.1 Vedic Scheme

Classification had been practiced ever since thinking began. This means "ever since man came into being". In fact, the term 'man' denotes 'thinker'. For it is derived from the Sanskrit and Indo-European root 'man'. which means 'think'. Classification had been practiced in the very ancient Vedic Period-the earliest known period rich in literary remains. The Vedic Literature mentions a Scheme of Classes. The Vedic Scheme of Classes postulates four Main Classes of Knowledge-Dharma, Artha, Kama, and Moksha. These main classes correspond roughly and successively to our modern partially comprehensive classes:

1. Religio-Social Sciences with Natural Natural Sciences as auxiliaries (= Dharma);

2. Economico-political Sciences with Natural Sciences as auxiliaries (=Artha);

3. Creative or Fine Arts including Literature with Linguistics and Psychology as auxiliaries (=Kama); and

4. Spiritual Experience with Logic, Epistemology, and Metaphysics as distant intellectual auxiliaries mediating between intellectual and trans-intellectual experiences (=Moksha).

These main classes were further subdivided.

1.1.2 Greek Scheme

There is similarly a Greek System of Classes. This led successively to the Scholastic, the Baconian, and the later European Systems of Classes. These are well known.

1.1.3 Chinese and Semitic Schemes

There should be also a Chinese and a Semitic Scheme of Classes. These should have probably taken shape during the interval between the Vedic and the Greek Schemes. It should be of interest to collect information on them.

1.1.4 Implication

The implication of a Scheme of Classes is that

1. Existents in the universe of knowledge are divided into groups on the bases of some characteristic relevant and helpful to the message of the Five Laws of Library Science;

2. Groups are arrange in a helpful sequence:

3. Each group is again treated similarly;

4. This process is repeated as often as necessary; and

5. Finally, classes of diverse removes from the original universe of knowledge emerge and stand arranged among them-selves in a helpful and filiatory sequence. Such a set of classes constitutes a Scheme of Classes.

Scheme of Classification

It is helpful to distinguish between a Scheme of Classes and a Scheme of Classification. The latter differs from the former in having a distinctive class number to represent each class. The class number becomes necessary, when we have to deal with documents or catalogue entries of documents. These are often taken out for use from out of their respective places in the collection. After use, they should be replaced in their correct places. The class number mechanises this replacement-that is, it eliminates the need for re-thinking about the relative positions of the documents or the entries of in it to. Again the universe of knowledge is continuously growing and throwing out new classes. The finding of the right, filiatory, helpful place for each such new class among the already existing ones is also rendered easier by representing each class by a unique class number. The class numbers constitute in effect an artificial language of ordinal number. It may be called a Classificatory Language. There should be no synonyms or homonyms in a classificatory language if the mechanisation of the arrangement of the classes and of the documents embodying them or of the entries of the document is to be free from any ambiguity or noise.

Definitions

1.3.1 Scheme of Classes

Statement showing the filiatory sequence of the classes arising in the course of the successive divisions of the universe of knowledge.

1.3.2 Scheme of Classification

Scheme of Classes fitted with terminology and notation.

1.3.3 Library Classification

Alternative name for Scheme of Classification. This is the third meaning of the term 'Classification' according to my Classification and Communication [16].

Planes of Work

The definition of the term 'Library Classification' implies that it will have to be pursued in the three planes:

1. Idea Plane;

2 . Verbal Plane; and

3 . Notational Plane.

My own thinking on the subject had been subjected to a considerable handicap, till these three planes were separated. They were fully separated in 1952 [17]. Since then a considerable progress had been possible. Generally, Work in the Idea Plane is vitiated by several fallacies, arising out of faults in the Verbal Plane. Faults in the Verbal Plane lead to ruin at all levels-from the personal level to the international level. It is no wonder that work in the Idea Plane is blocked or is diverted to wrong lines by faults in the Verbal Plane. Faults or poor versatility of the Notational Plane has to implement the results of the work in the Idea Plane. Incompetence in the Notational Plane induces inhibition in the Idea Plane. A sense of fatalism grips the Classificationist and the Classifier alike. I had been frustrated by this sense on several occasions during the last forty years. Now-a-days, I quite often succeed in averting this danger. I feel that giving undue weight to Purity of Notation or Shortness of Class Number or "Pronouncibility of Class Number" is like allowing the tail to wag the dog. Let us by all means turn our attention to; them-but only after succeeding in making the Notational System implement, in some way or other, the findings of the Idea Plane. For, the latter is paramount in Library Classification.

Bounded Field

Thus, in relation to one of the terms of the title of this address, our universe of discourse is bounded. It is confined to Library Classification-that is, to a Scheme of Classification for the universe of knowledge-that is again, to a Scheme of Classes of the universe of knowledge fitted with a notation of ordinal numbers. In the pursuit of library classification, we shall have much to do with problems arising in the Idea and the Notational Planes. But in an international gathering, the problems arising in the Verbal Plane cannot be dealt with in detail. We should however touch upon them.

CENTURY

We shall next define the boundary of our subject in respect of the second concept denoted by the term 'Century'. For our purpose, numbering the centuries as in the Christian Era will not be of help. For, the centuries of that Era are not commensurable with the centuries of the Classification Era. Again as already stated in Sec 15, our interest is in Library Classification. As seen in Sec 132, the Notational System is a part of the very essence of Library Classification. Further, the Notational System should be sufficiently versatile to keep step with the turbulent developments in the universe of knowledge. As such, the beginning of the Classification Era could not have been far in the past. Viewed from this angle, let us agree to take the Classification Era to have begun

in 1876. That was the year of the first publication of DC. DC stands out as a pioneer in the field of work of this Conference. It has succeeded in making us Classification-Conscious. Thus in relation to the second substantive term in the title of the address our universe of discourse is bounded by the years 1876 and 1975.

Three Periods

It is convenient to break this century-the first century in the Classification Era-into the following three periods:

1. Pre-Facet Period: 1876 to 1896;

2. Transition-to-Facet Period: 1897 to 1932; and

3. Facet Period: 1933 to 1975.

Three Sub-Periods

It is convenient to recognise the following three sub-periods within the Facet Period:

1. Restricted Facet Formula Period: 1933 to 1949;

2. Unrestricted Facet Formula Period: 1950 to 1956; and

3. Relativity Period: 1957 to 1975.

Two Sub-Sub Periods

It is convenient to recognise the following two sub-sub periods within the Relativity Period:

1. Dorking Period or Postulates-and-Principles Period: 1957 to 1964; and

2. Elsinore Period or Co-operative Design: Period: 1965 to 1975.

PRE-FACET PERIOD: 1876-1896

3.1 Achievement

The well-known lasting achievements of the Pre-Facet Period are:

1. Use of the knowledge-contents or the subjects of books as the basis for the classification and arrangement of the books and of their main entries in catalogues and bibliography;

2. Use of a notational system of ordinal numbers to mechanise the arrangement of books and of their entries; and

3. Use of the pure decimal-fraction in the notational system.

These are remarkable achievements for a youth that Melvil Dewey was, at the time of his hitting on them. These give a measure of his genius. John Eaton, the then Commissioner for Education in USA played John the Baptist. He published DC in the influential Annual report for 1976, turned on the Centennial Exposition. This is a measure of his statesmanship.

3.2 Social Ecology

The social factors shaping the non-faceted structure of DC were:

1. The number of printed books in library collections exceeding the capacity of the human memory to remember the books on a given subject and retrieve them from an alphabetical arrangement by names of authors;

2. The number of books printed each year adding its own share to the capacity of memory being exceeded;

3. The practice among readers and in libraries of using only the whole book-or-macro thought-as the unit of demand and service;

4. The macro thought embodied in books seldom presenting more than one Isolate Facet, in addition to the Basic Facet;

5. Books of local description, involving Space and Time Facets, not being many;

6. The people outside the Western countries being in a state of cultural exhaustion. Few works being currently produced by them. Their ancient classics just then being brought to the notice of the West. These classics not coming into use in the libraries of the West. Their not having begun to colour the public mind; and

7. The social pressure and the population pressure leaving learning and research to the care of a few and allowing a leisurely pursuit of knowledge. Thus the rate of development of the Universe of Knowledge being small.

3.3 Consequence

The consequences of the social factors prevailing at the beginning of the century were many.

1. A largely Enumerative Monolithic Scheme of Classification proved sufficient;

2. The inexorable Law of Least Action made DC enumerative and monolithic;

3. The Law of Parsimony; led to the use of 'Divide Like' Device-that is, Subject Device;

4. It also led to the scheduling of a set of Common Isolates;

5. There was no pressure from literary warrant calling for a schedule of Time Isolates as common isolates;

6. Similarly, there was no pressure for making the scheme of classification properly balanced in respect of American and European thought on the one side and all other thought on the other;

7. The rate of development of knowledge was too low to make the design of the foundation of library classification anticipate a future period of turbulence.

8. The Law of Least Action appears to have prevented going beyond the sufficient expediency of an Enumerative Scheme of Classification.

These consequences affected not only DC but also Cutter's EC (1893). EC was not essentially different from DC. It only chose another Sequence of the Basic Classes and adopted a literal notation instead of a purely numeral one.

TRANSITION-TO-FACET PERIOD: 1897-1932

Achievement

The achievements of the Transition-to-Facet Period may be said to have had the status of a pilot project. These are:

1. Venture into the work of arranging in a helpful sequence the main entries in periodicals-micro documents embodying micro thought as we call them;

2. Venture into pulling out of some of the subjects certain facets such as Time Facet and Space capable of getting attached to any Host Class whatever and also another kind of facet-called Analytical Divisions-capable of getting attached to any host class falling within the area of a single Main Class; and

3. Venture into the use of Mixed Notation not for lengthening the base of the notation but for use as distinctive Connecting Symbols for the different kinds of facets.

The pioneer scheme of this triple venture was UDC.

Social Ecology

The social factors leading to the Transition-to-Facet period were as follows at the beginning of the twentieth century;

1. A world accumulation of about one million documents; including micro ones;

2. Annual rate of increase by about one million documents;

3. An attempt by the scientists themselves to meet the situation and their failure; and

4. Library profession not developed sufficiently to become aware of the consequences.

These factors stimulated Henri La Fontaine and Paul Otlet to step into the field, though neither was a librarian nor a research worker by profession. They started with the

DC core and grafted to it the facets mentioned in Sec 41 (2). Donker Duyvis took it over in 1924. The first stage of the grafting work leading to the full-fledged UDC went on from 1922 to 1933.

Consequence

1. The Mainly Monolithic Enumerative Scheme in vogue proved insufficient;

2. In the absence of any better scheme in print, DC was accepted and the grafting to it of three kinds of facets was made;

3. Changes were made in the details of enumeration found in the DC core itself, to the extent of about 60%, by Donker Duyvis according to his ;own statement [2];

4. The Law of Least Action appears to have made such an improvisation appear sufficient;

5. The foundation of the core, continued to be the same; and

6. An organisation was set up within the International Federation for Documentation to help UDC keep step with the changes affecting its core, not by any fundamental change in its very foundation and structure, but only in the enumeration of the classes.

RESTRICTED FACET FORMULA PERIOD: 1933-1049

5.1 Achievement

The achievements of the Restricted Facet-Formula Period are:

1. Replacing a virtually monolithic, long Schedule of Classification forming the core, by a large number of short Schedules for Classification; and for this purpose,

2. Starting with a short Schedule of Basic Classes;

3. Providing for each Basic Class a short Restricted Facet Formula;

4. Providing for each Basic Class a short Schedule of Isolates for each of the facets mentioned in the Facet Formula; and

5. Providing Connecting Symbols between facet; in addition to

6. Providing schedules of Common Isolates for Time, Space, and Anteriorising Common Isolates.

5.2 Social Ecology

The chief social factor leading to the Restricted Facet Formula concerned a perceptible change in the subjects embodied in books. These were:

1. In the early years of the Classification Era, the subjects in the majority of the books contained only one facet. In the few subjects presenting two facets, one of the facets was virtually a non-developing one. Therefore, DC put this facet first and froze it. The developing facet was taken as the second facet.

2. But about the 1920's the subjects of an appreciable number of books presented two or more facets and none of the facets admitted of being frozen.

5.3 Consequence

1. Provision had therefore to be made in the Notational Plane for adding new digits to any isolate number in any facet and not merely in the last facet;

2. This situation was met by CC with the aid of a Facet Formula for each Basic Class; and

3. It prescribed the same Connecting Symbol Colon for all facets;

This proved sufficient for the classification of macro thought embodied in a whole book. The inexorable Law of Least Action appears to have made Faceted Classification stand arrested at this near-primitive stage.

6.   UNRESTRICTED FACET FORMULA PERIOD: 1950-1956

6.1 Achievement

The achievements of the Unrestricted Facet Formula Period are:

1. Looking upon each Isolate Facet of a subject as the manifestation of one and only one of one or other of the Five Fundamental Categories PMEST (Personality, Matter, Energy Space, and Time);

2. Prescribing a different Connecting Symbol for the different Fundamental Categories;

3. Hitting upon a Generalised Facet Formula, Depicting any number of facets, which a subject may present;

4. In order to systematise the sequence of the many facets, hitting upon the concept of each Energy Facet being capable of being followed by other Round of Facets and upon the concept of each Round of Facets being Capable of holding any number of Levels of Personality Facets and of Matter Facet and of the last Round of Facets being capable of holding in addition any number of Levels of Space Facet and Time Facet.

6 Developing the concepts of Zone Analysis in the Idea Plane and in the Notational Plane independently and of correlating the results in the construction of schedules. The adding of a fourth zone made of pocketed numbers.

6.2 Social Ecology

The chief social factors leading to the use of Unrestricted Facet Formula were the following:

1. World War II had brought to the surface the need for the classification of nascent micro thought in the natural sciences embodied in; articles in periodicals;

2. The rate of increase and the accumulation of patents and standards also indicated the need for the classification of micro thought; and

3. A general awareness of the value of Depth Classification-that is, fitting nascent micro thought with co-extensive class numbers-began to permeate among the library profession engaged in libraries of industrial research. Because, it was found the overlooking of any nascent micro thought, created during the year, or the month or even the week, somewhere within one and the same enterprise or even anywhere else in the world, led to a considerable loss of money and to dissipation of the all-too-small man-power available for research.

6.3 Consequence

The impact of these social factors on the library profession led to the following awareness:

1. It is improper to leave the problem of organising nascent micro thought to the sole care of the research workers them selves. The scientists themselves realised this. Witness, for example, the finding of the London Conference convened by the Royal Society in 1948;

2. The organisation should be taken up by the library profession. The Chicago Conference on Bibliographic Organization (1950) [5] was a large-scale evidence of this. It was at this Conference that the various kinds of the hampering rigidity of a restricted pre-determined facet formula were systematically exposed;

3. This led the profession to realise the need for research into the Theory of Classification. The FID/CA for the purpose. The Library Research Circle of India and the Classification Research Group of London were formed as free assemblages of persons interested in the subject. Similar organisations had probably come up in other places too. The nine Annual reports of the FID/CA, the results of the Library Research Circle communicated in the three volumes of the Annals part of the Agile and the first ten volumes of the quarterly Annals of library science, and the monthly Minutes of the Classification Research Group cut new ground;

4. The World Conference of 1955 in Brussels lifted the pursuit of Depth Classification to a higher level of international recognition; and

5. The Dorking Conference of 1957 may be taken to be the culmination of the progress of work in the period 1950 to 1956.

7   DORKING PERIOD: 1957-1964

The seven years forming the Dorking Period have witnessed hectic activity in the March of Classification through its first century. We are too near it-and indeed still within it-to evaluate these activities clearly. We shall, therefore, permute the steps of presentation and take up the social ecology of the period first.

7.1 Social Ecology

The social of the period shaping the March of Classification have been as follows:

1. The earlier period had accustomed the library profession practicing in research libraries to the advantages of the use of depth classification in feeding research workers.

2. In the meantime, the population pressure has begun to exceed the capacity of the natural and the near-natural commodities for maintaining it.

3. Therefore, the urgency to substitute, in the place of solo research by stray men of genius, relay research by teams made up of persons of different removes from a genius is being realised not only by the scientific workers but also by the statesmen in charge of the affairs of the world.

4. To add to the difficulty and indeed as a consequence of the above factor-the output of articles in periodicals embodying nascent micro thought in the wave front of knowledge has increased many fold-to nearly 20,000,000 articles in a year.

5. The number of documents even within a conventionally narrow subject area is increasing at a rate beyond the limit of comfort.

6. The post-war development of Electronic Engineering has been phenomenal. It has become ubiquitous in respect of its field of application. It has begun to enter into many areas of life. It is also affecting the outlook on the methods of literature search.

7.2 Consequence

The impact of these social factors on the library profession has led to the following awareness:

1. The present rate of increase in; the number of documents makes it wasteful to leave literature search in the hands of the research workers themselves. There

is need to conserve the research potential by a division; of layout. In this division of labour, literature search falls to the share of the library profession.

2. The library profession is forced to improve its methods of organising the entries of micro documents in a more efficient way than hitherto. In the absence of an exceptional man of genius appearing in the field and presenting us with a ready-made solution, the profession has to engage itself as a team in intensive intellectual research to design a truly individualising Scheme for Depth Classification.

3. The phenomenal progress in electronic engineering has had a two-fold effect on the work on classification.

   31 In the first instance, it seems to have taken the library profession to very near the mood to say, "So long as there are electronic engineers to handle this difficult task, we can rest on our oars". Even as a theist might say, "So long as there is a God in Heaven to look after us, we need not exert ourselves'. The Washington Conference on Scientific Information Retrieval (1958) tended to mesmerise the profession.

   32 We have now nearly outgrown that temptation to in-action. We have now reached the second stage when we can say, "The electronic machinery can no doubt obtain phenomenal speed in doing a certain kind of job for which it may be set. It can do the data work at that speed. For, the different data pertaining to a given entity are commutable. But in literature search the Law of Commutation does not hold good". It may be that the engineers can get round this difficulty to some extent.

   33 But we are also beginning to be aware of the need to examine the viability of such versatile machinery for literature search-the capital cost, the rate of obsolescence, the cost of maintenance, the quantity of work which it should be made to do to make it worthwhile, and so on.

   34 At any rate, perhaps the engineers too are in a mood to concede that a preliminary sorting out of the millions of entries into small groups of a few thousands, is desirable before the help of machinery is invoked.

   35 The library profession is also beginning to approach the engineers with a problem such as follow: "A preliminary sorting will require for its help a system of class numbers using several different distinctive digits-say, about 70 of them. Is it more economical for you to work only on binary basis? If so, is it more difficult for you to translate into binary machine language a class number using combinations and permutations of 70 distinctive digits than it is of words in a natural language using a number of alphabets ranging between 26 or 52 in the Roman alphabet and perhaps to a few more in other alphabets?"

4. Expecting full co-operation from electronic engineers to fight their own battle to meet our suggestion, we have also begun to emphasise some important purposes other than retrieval to be served by a classification scheme. These were outlined in the Dorking Conference as follows [10]:

41 Finding out by a participative conversation with the reader the precise and exhaustive formulation of his requirements in all their facets and phases;

42 Seizing quickly and unmistakably and in a systematic and canalized way all the relevant isolates of the document classified, while dealing with it in the idea plane;

43 Making a balanced book selection;

44 Forming topical sequences in the library and preparing topical documentation lists to answer exactly and exhaustively the needs of the readers on particular occasions; and

45 Laying bare fallow sectors in the universe of knowledge and thus helping to bring them under cultivation.

5. Objective experiments have been in progress to compare the efficiency of machine retrieval and of retrieval by the conventional catalogue with subject headings derived by Chain Procedure from Faceted Class Numbers. My feeling is that the Faceted Scheme of Classification and the Rules of Chain Procedure used in the experiments are not the best available. These two techniques are still in the formative stage. Rapid progress is being made in certain directions. And there are other directions yet to be pursued. Therefore, my feeling is that the projects of comparison have been somewhat premature. But it has shown a way.

7.3 Achievement

The achievements of the Dorking Period are in each of the following areas:

1. Idea Plane;
2. Verbal Plane;
3. Notational Plane;
4. Methodology for the Design of Classification-particularly of the Depth Classification needed for documentation work and documentation service;
5. Schedule Building; and
6. Machinery for document retrieval.

7.4 Achievement in Idea Plane

7.4.1 Postulates

As the Dorking Conference the following statement was made. "It is helpful to clear thinking and further development if a Scheme of Classification can be based on a system of explicitly stated postulates which lay bare the unexpressed assumptions implied in thinking." A tentative list of seven postulates was also given [12]. In 1962, the following 12 postulates were formulated for the Idea plane [13]:

1. Postulate of Fundamental Categories;

2. Postulate of Basic Facet;

3. Postulate of Isolate Facet;

4. Consolidated Postulate about Subject;

5. Postulate of Concreteness;

6. Postulate of Sequence;

7. Postulate for Space and Time Facets;

8. Postulate of Rounds for Energy:

9. Postulate of Rounds for Personality and Matter;

10. Postulate of Sequence within a Round;

11 Postulate of Levels; and

12 Postulate of Level Cluster.

During the Dorking Period, classification of documents based on these postulates has been extensively practiced. They have been found helpful. Teaching of classification also has been based on these postulates. This method seems to have been helpful.

7.4.2 Principles For Facet Sequence

In the past the determination of the sequence of the facets of a subject had been left to flair. Further, the Postulate of Sequence is helpful only for determining the sequence of a single manifestation of each Fundamental Category within a Round. Therefore, generally speaking flair reigned supreme. This was far too subjective. Moreover, determining the sequence between two facets in the phenomenal level is often tantalising. During the Dorking Period the determination of facet sequence has been taken down to a near-seminal level and the following five principles have been postulated for facet sequence [13]:

1. Wall-Picture Principle;

2. Commodity-Raw-Material-Transformation Principle;

3. Acted-Action-Actor-Tool Principle;

4. Cow-Calf Principle; and

5. Whole-Organ Principle.

Of these five principles the Wall-Picture Principle is the basic one. The other four are more like corollaries. They have been formulated for ready application.

7.4.3 Detection of Fallacy 1

Even before the Dorking Period, it had been recognised that a class formed of some whole entities of a universe should be distinguished from a class formed of some organs of remove 1 of a typical whole entity of the universe. It was further recognised that theses two should be treated as successive levels of facets within a Round. Experience with this concept has been largely confined to Personality Facet. It is improper to treat different isolates formed of whole entities on the basis of different First Characteristics as belonging to different levels. However, in some cases they were treated as if they belonged to two different levels. This happened-particularly when the isolates in array of order 1 of a facet were Quasi Isolates-that is characteristics on the basis of which the entities are to be classified. For example, the Systems and the Specials in Medicine have been treated as different levels of Personality Facet. This is evidenced from the fact that the connecting symbol comma (,) has been prescribed for insertion between the System Isolate Number and the Specials Isolate Number. This error was detected in a discussion in the DRTC class in November 1963. The correct connecting symbol should be hyphen (-). In the Idea Plane, this means that it is a case of superimposition of two isolates in one and the same facet.

7.4.4 Detection of Fallacy 2

Matter as an attribute of a Personality-say of a commodity-should be treated only as a characteristic for forming classes of the Commodity. In other words, in this context Matter will be a first Quasi Isolate used in deriving classes of Whole Commodities. It is not proper to regard Matter as a matter Facet in this context. It can be treated as Matter Facet if and only if the subject of study is the Matter of which the commodity is made and not the commodity itself. But this difference was recognised only in November 1963. It was in a DRTC class. Prior to that the fallacy involved in this has been persisting all along. For example, the number for "Plastic Dupont Tube' [4] has been given as 2D; F52. To put it in another way, 'Plastic is only a qualifier in this context-a qualifier of the Personality Isolate Tube-and not Matter qua Matter.

7.4.5 Combination of the Two Fallacies

The above-mentioned two fallacies have also been occurring together in the past.

7.4.6 Concept of Integrative Levels

Some thought has been turned on the usefulness of the concept of Integrative Levels. The incidence of this concept is evident in the schedule of the main classes of CC. It is my feeling that this concept may not be of much help in a deeper level.

7.5 Achievement in Verbal Plane

Verbal Plane figures in two different ways in library classification. Firstly, Verbal Plane pertains to the natural language used as meta language in the development of the Classificatory Ordinal Language. Secondly, it pertains to the names of the Basic Classes and the Isolates in a Scheme for Classification.

7.5.1 Meta Language

In the Brussels International Congress of Libraries and Documentation Centres held in 1955, a resolution asked for the establishment of a glossary of the classificatory terms in use in each school of thought. In pursuance of this resolution a tentative glossary was published for the Indian School of thought in 1958 [8]. Using this as a preliminary draft the Indian Standards Institution has now finalised a standard glossary in the English Language [3]. Another glossary pertaining to the American School of thought has also been published [18].

7.5.2 Names of Classes and Isolates

Hardly any work has been done on the nomenclature of the Basic Classes and the Isolates occurring in schedules for or of classification. However, a difficulty arises in the derivation of subject headings by Chain Procedure, even when the comparatively precise one-worded terms in the CC schedule are use. The difficulty centres round the homonyms in subject headings. It is conjectured that homonyms can arise in subject headings only when one and the same term is used in the Scheme for or of Classification, used in Chain Procedure to denote both a Basic Class and a Common Isolate. To get over the difficulty, the tentative solution of using auxiliary words within square brackets without ordinal value was first suggested [9]. It has now been found that it is more helpful to insert this after the substantive word or word-group forming the component heading.

7.6 Achievements in Notational Plane

7.6.1 Non-Structural Notation

"Non-structural notation' and "Non-hierarchical Notation" have been experimented upon to a considerable extent in UK. Such a notation is based on a theory not accepting the Canon of Expressiveness though accepting the Canon of Co-existensiveness. Perhaps, the time has come to evaluate this concept critically.

7.6.2 Interpolation Within an Array

Till now we had no method of interpolating a co-ordinate isolate number within an array except by the method of gaps which is a very weak method. The concept of Emptying Digit postulated in 1962 has provided a neat solution. One example: Consider the following three foci in the array of Order 1.

K Zoology

KX Animal husbandry

L Medicine

This is no doubt a helpful sequence. Originally, only the first and the third foci were scheduled. The second focus needs to be interpolated between them. It has been interpolated. The focal number is the digit-pair KX. Here X has Emptying Value-that is it empties the semantic richness of the preceding digit K but allows it to retain its ordinal value. This concept has added to the versatility of the notation of CC [11].

7.6.3 Sector Analysis

A systematic study of zone analysis and of the different sectors falling within each zone was begun in 1963 at DRTC and completed in 1964. The sector notation has equipped CC with the power to implement the findings of the Idea Plane in respect of the Isolates of a Personality Facet likely to arise in subjects going with a Basic Class and-to demand classification on the basis of several characteristics-even as many as twenty. This was first sensed in 1963, but was brought into systematic use only in 1964 [7] [11].

7.7 Design of Depth Classification

7.7.1 LC and UDC

The design of LC may be described as an ad hoc one made to suit the organisation of the collection in the Library of Congress. It was developed by a Committee. That means it was largely a product of collective intellection. It is not known whether the Committee had left any record of the principles by which it was guided either in fixing the sequence of classes in the Idea Plane or in implementing it in the Notational Plane.

As already stated in Sec 4, the main contribution of UDC to design work is the grafting of three kinds of facets to the DC core. This should have been largely a matter of intuition. But the modification in the DC core itself, beginning with the PE notes and ending with the final result are entrusted to several Committees. Their work has to be largely an intellectual affair. The Committees are no doubt guided by some principles. But they are mostly principles of procedure. They too are intellectual in; their nature. The 'Starvation Principle' is an extreme example. According to it a digit left without literary warrant for a long time is used to represent some other new array-isolate-idea with a considerable literary warrant. This is equivalent to totally giving no weight whatever to the helpful sequence found in the Idea Plane. However devoid of the touch of intuition, such principles are necessary if work is to be done by several Committees. A fairly exhaustive account of these principles was given by Donker Duyvis during the Dorking Period in a series of papers entitled Policy of revision of the Universal Decimal Classification [1].

7.7.2 DC, SC, and CC

On the other hand the design of Dc, SC, and CC may be said to have drawn to an appreciable degree from intuition, though the work of giving the finish has been largely intellectual.

7.7.3 Scientific Method

During the First Century of the Classification Era, a good number of schemes have come out. Their comparative study has enabled us to realise that the design of classification has entered the Spiral of Scientific Method. Each cycle in this spiral is made of work pertaining to the one quadrant of intuition and to the three quadrants of intellection [5]. The work based on intuition gives the Canons of Classification, the Postulates for Classification, and the Principles for Facet Sequence and Isolate Sequence in an array. Work in the other three quadrants gives a methodology for the systematic design work to be done by intellection. This work can be done by a team of workers. After a struggle of over two decades, the discussion with the members of the DRTC in November 1963 broke through a barrier, as it were. This result has given a systematic methodology for the design of Schedules for Depth Classification[6]. This break-through has opened the flood gates. Trial designs have been start.

7.8 Achievement in Schedule Building

7.8.1 Demonstration Work

Based on the above Methodology, for the Design of Depth Classification, tentative Schemes for the Classification of Production Engineering in respect of Screw, Nut, Bearings, Reciprocating Internal Combustion Engine, Gas Turbine Engine, Transistors, and Radar, and for the classification of Book Science and of the Pharmacology and Technology of Drugs, have been worked out so far. We have naturally to begin with easy-to-grasp subjects. Work on the design of depth classification of each subject reveals some new guidance likely to be of use in more complex subjects.

7.8.2 Projects in Schedule Building

Even before the Methodology was laid down, Schedules for the Faceted Classification have been built during the Dorking Period for a few subjects.

7.8.3 Telescoping

Some experiments have been made during the period in building schedules with telescoped arrays and facets. A critical study of these experimental schedules may disclose some valuable principles for schedule building.

7.8.4 Rider's International Classification

A new general classification produced in the Dorking Period is Rider's International Classification. But it is avowedly a scheme improvised for the classification of books in generalist collection with about 100,000 volumes, and not intended for the depth classification of micro-documents. Therefore, it makes no mark in the March of Classification in the first century of the Classification Era.

7.8.5 General Versus Special Classification

During the Dorking Period the theme "General versus Special Classification" has been kept alive in UK and USA. My feeling is that this antithesis is traceable to the

absence of a good theory of classification during most of the first century of the Classification Era. During the last few years a theory has been taking shape. But due to lack of effective communication its deeper import has not yet permeated sufficiently. There still persist different ways of understanding the concepts, such as Fundamental Categories, Levels of Facets, Dimensions, and Parameters as used in the Schemes of Classification. The full potentiality of the concept of Phase Relation has not yet been explored. A reliable criterion about what should be recognised as a Basic Class has not yet been found out. The controversy about "General versus Special Classification "will disappear only when the theory of classification is fully developed and widely understood and accepted. The difficulty due to nebulousness about some of the basic concepts mentioned above is most pronounced in Sociology and in some of the other social sciences. Another factor contributing to the difficulty in this field stems from the looseness of the terminology current in the subjects concerned.

7.9 Achievement in Machinery for Search

A considerable work is in progress for document retrieval by machinery in USSR, and perhaps in other countries. India has not done any work in this field. As stated in Sec 72 work of electronic engineers and that of classificationists appear to have just begun to influence each other. The nearer they come, the more appreciative they become of each other's needs and difficulties, the more helpful will be the March of Classification.

Elsinore Period: 1965-1975 The Elsinore Period covers the last eleven years of the First Century of the Classification Era. It lies entirely in the future. It is hazardous to assert anything about the probable happenings in the future in respect of any human activity whatever. The March of Classification is no exception to it. And yet, we may with some confidence peep into the immediate future of the next decade, subject to the risk of a highly improbable sudden mutation taking place in the social factors and in the mode of thinking of humanity, we can get a glimpse into the immediate future by projecting the achievements of the past. At any rate, we can say what we wish should happen. We can enumerate the work waiting to be done. We can outline a programme of work. Here is a programme under three heads:

1. Fybdamental research;
2. Routine research; and
3. Organization.

8.0 WHY 1957 TO 1975 IS CALLED RELATIVITY PERIOD?

Before detailing the programme, the reason for giving the generic name Relativity Period to the Dorking and the Elsinore Periods taken together may be given. During the Relativity Period, it was consciously realised that the Facets belong only to a Subject and not to a Basic Class. Before 1962, all thinking in the Idea Plane and the Notational Plane had been done as if the Facets belonged to the Basic Class. The term 'Facet Formula' for a Basic Class coined in the Verbal Plane caused this illusion. The illusion was lifted in 1962 when the Eight Steps in systematic Practical Classification were isolated. This has

led to the realisation that a subject has compulsorily a Basic Class as its Basic Facet and that it may have one or more Isolate Facets. It is a Compound Subject with one or more Isolate Facets that has a Facet Structure. The subject "Hamlet of Shakespeare (the English Dramatist)" has a Facet Structure in which the Facets are the Basic Facet "Literature" and the four Isolate Facets "English", "Drama", "Shakespeare" and "Hamlet". But the Basic Class "Literature" has no Facet Structure. Those Facet Structure exists only relatively to a Compound Subject. It is now being considered whether it would be more helpful to regard "English literature" instead of "Literature" as the Basic Class of the subject considered.

8.1 Fundamental Research

The programme for fundamental research may include the following:

8.1.1 Idea Plane

1. Break-even points between composite concepts and fundamental constituent concepts in diverse regions of knowledge.

2. Formulation of alternative systems of postulates as possible bases for design of classification systems.

3. Formulation of a criterion for the concept of Basic Class.

4 Building abstract models of classification guided by different systems of postulates and principles including the Postulate of Basic Class. All these were mentioned at the 1959 Warsaw Conference of FID. The only item mentioned there and completed in the Dorking Period is Principles for Facet Sequence [14].

8.1.2 Verbal Plane

1. Establishing a standard nomenclature in different fields of knowledge for each of the diverse languages, for use in the schedules for or of classification; and for this purpose,

2. Formulating principles of guidance for the establishment of a standard nomenclature; and

3. Solving the difficulties arising in the Verbal Plane in deriving subject headings from class numbers.

Work is in progress in respect of (1) and (2) under the auspices of ISO TC/37.

8.2 Routine Research; Warsaw Programme

At the 1959 Warsaw Conference, a set of problems for routine research was presented to FID. Of these, no problem has been fully pursued. A pilot schedule for Common Property Isolates was published. But it has not yet been completed. Some work has been done on Common Energy Isolates at the Documentation Research and Training Centre (DRTC), Bangalore. It started with 5,000 possible common energy isolates picked

up while perusing several abstracting periodicals. They have now been boiled down to about 1,000. During the course of this work, we came across some semantic problems. Therefore and for want of time, it has not been possible to construct the schedule. In view of this, the entire Warsaw Conference programme is reproduced below, as part of the programme for the Elsinore Period.

8.2.1 Warsaw Programme

1. Schedule of Common Energy Isolates which may include 1,000 isolates and require one man-years of work.

2. Schedule of Common Property and Value Isolates which may include 10,000 isolates and require three man-years of work.

3. Schedule of all kinds of materials-raw, intermediate commodity and ultimate commodity-which may include ten thousand million isolates and may require 100 man-years of work.

8.3 DEVELOPMENTAL RESEARCH: DESIGN OF DEPTH CLASSIFICATION:

NEW PROGRAMME

1 With the aid of the methodology referred to in Sec 7,

schedules of depth classification should be built for several

Basic Classes.

2 First preference may be given to Basic Classes in Engineering. They deal with materials having a definite shape or form. Therefore, the determination of the various characteristics fit to be used as Quasi Isolates for the Personality Facet can be more easily recognised.

3. In the light of the experience gained, we may pass on to the Basic Classes in Chemical Technology.

4. Perhaps, simultaneously work may also be taken up with Basic Classes in the Social Sciences, though the difficulty may be of a slightly higher order.

5 Some other teams may work on the schedules for Anteriorising Common Isolates and on the schedules for Time and Space Isolates in their respective levels. Here, some tentative work has been done in India. It requires revision and completion in the light of the latest ideas. The first round of Routine Design of Depth Classification for diverse subject fields may require about 5,000 man-years of work. This should be done by several teams on an international basis.

8.4 ORGANIZATION

The programme of fundamental research will have to be carried out by individuals. It will not be very much amenable to organization or team work imposed from outside. On the other hand, the routine research and the design of depth classification mentioned in Sec. 82 are eminently fit for organized team work. (See Sec. 82 and 83.) There may also be a team doing liaison between classificationists on the one

side and the electronic engineers on the other. The teams can be distributed among several countries. But it is desirable that the teams get an orientation course. Probably the orientation course can be given in each of the different countries taking part in the programme. Then comes the question of selecting the necessary man-power of the right kind Finally comes the question of finding the necessary finance. Perhaps this will have to be found by the industries and the governments of the different countries, the Foundations in the different countries, and by Unesco. The FID should take up working out the details of the organization and also the co-ordination of the several teams working on these programmes. The earlier we complete the various items of the programme, the more helpful it will be. It is in the hope that such a programme of international team work will be carried out during the next decade that the Elsinore Period has been given the alternative name Co-operative Design Period.

9 BIBLIOGRAPHICAL REFERENCES

Note- 1. The following is the list of documents used.

2. Column 1 gives the serial number of the documents.

3. Column 2 gives the number of the section in the text, where the reference to the document is made.

1 Sec 771 Duyvis (Donker F).Policy of revision of universal decimal classification. (Rev. doc. 23; 1956; 140-2. 24; 1957; 29-30, 95, 157-9. 25; 1958; 82-4).

2 Sec 43 ---. Policy of revision of universal decimal classification (1). (Rev doc. 23; 1956; 140).

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4 Sec 731 MOGHE (V S). Role of level. (Ranganathan (S R), Ed. Depth classification and reference service and reference material. 1953. P 100).

5 Sec 63 Colon classification and its approach to documentation. (Shera (J H) and Egan (M E). Bibliographic organization. 1951. P 96-103).

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8 Sec 751 Library classification glossary. (An lib sc. 5; 1958; 65-112).

9 Sec 752 Homonym in class index headings. (An lib sc. 10; 1963; Paper N).

10 Sec 72 Library classification and its added uses. (Libri. 2; 1951; 31-6).

11 Sec 762 Notational plane: Extra-polation and interpolation. (An lib sc. 10; 1963; Paper A).

12 Sec 741 Postulates for the idea plane. (Proceedings, International Study Conference on Classification for Information Retrieval (Dorking) (1057) p 6).

13 Sec 741 Postulates for the idea plane. (Rannganathan (S R). Elements of library classification. Ed 3. 1962. Sec U1).

14 Sec 742 Principles for facet sequence. (ibid. Chap V).   Sec 80

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17 Sec 14 Three planes. (Annals, Ind. Lib Assoc. 2; 1952 175).

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