CLASSIFICATION AND RETRIEVAL
PROBLEMS OF PURSUIT
DEPTH CLASSIFICATION 32

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Papers 10

Begins with a brief account of the work done in recent past in the theory of classification, including facet analysis, fundamental categories, zone analysis, common isolates, special isolates, and postulational approach. Estimates the Common Isolates for advance enumeration to be about 1,000 for Energy, 10,000 for Matter, and 100 for Personality. Conjectures the likelihood of special Isolates becoming quasi-common or seminal for Energy. Estimates the Special Matter Isolates for advance enumeration to be of the order $10^{10}$. States that the notational devices for the Special Personality Isolates are available to handle them as and when they emerge. Points out the need for additional principles to facilitate assignment of facets to levels and rounds, and for the investigation of semantic problems involved in the breaking down of Composite terms to fundamental ones.

Contraction used
CC: Colon Classification
UDC: Universal Decimal Classification

01 PAST WORK
01 Facet Analysis

Even micro subjects have to be classified to-day to facilitate literature search. Their number is already running into several millions. The annual addition to their number runs to several thousands. An all-through enumerative schedule of them is impracticable. Therefore, recent work in the theory of classification has reduced enumeration to a number of small schedules at the level of individual facets of subjects. This is the result of facet analysis. For each facet, the number of enumerated isolates is small, often less than a hundred. The annual addition of new enumerated isolates, in the case of most facets, is nil or negligibly small. In some facets, they can all be anticipated and enumerated in advance, without waiting for literary warrant to develop.

041 Isolates in Deeper Level

A facet comprehends only fundamental thought-units or isolates belonging to a deep semantic level, unlike composite thought-blocks or subjects belonging to the semantic surface level. At the deeper semantic level, the frequency of formation of new thought-blocks or subjects is very large — extremely large in the case of micro-subjects. This is a result of the possibility of the subjects at the semantic surface level being formed out of n-isolates. Future work should take enumeration to still deeper level — the seminal level. The number of seminal isolates will be extremely small. Even the decennial addition to their number will be negligibly small.
02 Five Fundamental Categories

The postulation of the five fundamental categories - Personality, Matter, Energy, Space, and Time - has implied the recognition of five corresponding kinds of facets. This has made further work more manageable. For, the number of isolates and the number of seminal isolates in facets vary from kind to kind. The rate of addition to their number also varies from kind to kind. The extent, to which formation of new isolates attracting literary warrant can be anticipated, varies similarly from kind to kind of facet. Facets of certain kinds are now known to consist only of a relatively small number of isolates. The few facets, requiring an indefinite addition to isolates have now been singled out. Further, these few are amenable to different methods of investigation. This is explained later in the paper.

03 Zone Analysis

For convenience of reference, we shall denote a focus in an array by the term Array-Isolate. We can use two characteristics to devide the array isolates into groups.

031 Special vs Common

One characteristic for division is the array-isolate being either
1 special to its host basic class or to its immediate universe; or
2 not special - that is being a common isolate likely to arise in relation to any or nearly any host classes.

032 Enumeration vs Device

The second characteristic for the division of array isolates into groups is the array being got either by
1 ad hoc enumeration; or
2 a device, such as alphabetical, chronological or subject device.

033 Kinds of Array Isolates

Each of the two characteristics is dichotomic that is, each yields only two groups of array isolates. The successive application of the two characteristics gives four divisions. In other words, four kinds of array-isolates are possible in an array. They are
1 Common isolate got by enumeration;
2 Special isolate got by enumeration;
3 Special isolate got by a Device; and
4 Common isolate got by a Device.

034 Zone Formation

It is helpful to put together - that is consecutively in the array - all the array isolates of one and the same kind. This creates four zones in an array. There are 24 ways of forming these four zones. In CC, they are formed in the sequence in which they are mentioned in section 33. The zones are numbered accordingly as zones 1, 2, 3 and 4.

035 Notational Character

The mixed notational system of CC makes the array-isolates numbers of each zone have, generally speaking, a distinctive character. A number of Zone 1 begins with a Roman small. A number of Zone 2 begins with an Indo-Arabic numeral or if it begins with an octavising Indo-Arabic numeral 9, its first significant digit is an Arabic numeral. A number of zone 3 begins with a Roman capital or if it begins with the octavising Indo-Arabic numeral 9, its first significant digit is a Roman capital. A number of Zone 4 begins with a circular bracket. UDC has not yet recognised the existence of these zones in an array being naturally formed in the idea plane itself.

04 Common Isolates by Subject Device: Zone 4

Zone 4 of an array does not raise any serious problem. Its isolates can be easily given isolate numbers as and when they emerge. The only possibility is that an isolate number got by subject device may become long. But, as and
when literary warrant of a particular isolate of this zone increases or is likely to go beyond a limit, it will be useful to transfer it to Zone 2. Notational provision can be easily made for this. Some experiments have been already done.

05 Common Isolates
by Enumeration: Zone 1

The 'Form Divisions' or 'Common Subdivisions' of the DC tradition had permeated all the schemes of classification, including CC. Their schedule has been found to be a hotch-potch. A summary of this analysis will be found in Prolegomena to library classification, ed 2, 1957, sec 458 to 45823. Section 458 of this book examines critically the Form Division of U.D.C. Some of its isolates do not belong to subject-classification at all. These have now been separated out in CC; they have been transferred to the care of Book Number. The residue is denoted by the term Common Isolate. An isolate having the same isolate term to denote it and the same isolate number to represent it, in the context of all or nearly all subjects, is called a Common Isolate. The common isolates lend themselves to further analysis. They fall into the five groups:

0 Anteriorising common isolate;
1 Posteriorising common time isolate;
2 Posteriorising common space isolate;
3 Posteriorising common energy isolate;
4 Posteriorising common matter isolate; and
5 Posteriorising common personality isolate.

By definition, they all belong to Zone 1. They need enumeration. In the light of the trend of the literary warrant of the past and the present, these common isolates can be anticipated more or less exhaustively. If their schedules are constructed, they will take care of nearly 80 per cent of the new micro-subjects turning up from time to time.

06 Special Isolates
by Device: Zone 3

Zone 3 does not raise any serious problem.

07 Special Isolates
by Enumeration: Zone 2

In general, Zone 2 alone cannot be filled up in anticipation. The isolates in it will have to be enumerated and added to from time to time in the light of and after the emergence of literary warrant. This problem will engage more attention in the case of Personality Facet than of others. Further, the necessity for this may be created only by about 10 per cent of the newly emerging micro-subjects. This is a conjecture.

08 Future Work

We shall next take a peep into the future. Some problems are pressing. Some require a good deal of man-power. Others require only small man-power. Some require only routine investigation. Others require more serious investigation. Some fall entirely within the field of the library profession. A few invoke the aid of other professions. Whatever result can be achieved will be equally of use for library classification, for the building of the library catalogue, and for the building of the machine language.

081 List of Problems

A list of 44 problems for pursuit is given in chapter 88 of my Prolegomena to library classification, ed 2, 1957. They stand grouped as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea Plane</td>
<td>16</td>
</tr>
<tr>
<td>Notational plane</td>
<td>11</td>
</tr>
<tr>
<td>Construction of schedules</td>
<td>7</td>
</tr>
<tr>
<td>Probably insoluble</td>
<td>3</td>
</tr>
<tr>
<td>Abstract classification</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Total 44</td>
</tr>
</tbody>
</table>
When the above list was drawn up, postulational approach was not well developed. The succeeding sections examine some of the major problems for pursuit as they appear when viewed from the angle of postulational approach.

1 TIME FACET

The entire time facet is a facet of common isolates. A considerable amount of work has been done on it. Analysis has disclosed the need for

1 Representing time measured in different eras;
2 Representing private time - that is time measured from a point intrinsic to a subject;
3 Use of different units for measurement - durations ranging from fraction of a second to geological ages; and
4 Second level of time-facet to represent seasons, night, twilight, etc.

This has been called Featured Times. This does not admit of quantitative division. It admits only of topological division.

The notational system of CC is resilient enough to implement the findings of the idea plane in respect of all these. The notational system of UDC is nearly resilient. Suggestions have been made to make them fully resilient. All this work is only a first attempt. It is contained in my Common isolates in documentation work (3) Time isolate, (Review of documentation, 23, 1956, 70-79). It requires testing, improvement, and being placed on a firm footing.

2 SPACE FACET

The entire space facet is a facet of common isolates. A considerable work has been done on it. Analysis has disclosed the need for

1 Dividing the surface of the earth as well as any area in diverse ways to meet the requirements of different subject;
2 Second level of space-facet to represent physical features, etc. (This has been called Featured Space); and
3 Third level of space to represent different horizontal strata.

The notational system of CC is resilient enough to implement the findings of the idea plane in respect of most of these. The notational system of UDC can be made equally resilient. Its sequence of levels needs examination. The result is contained in my Common isolates in documentation work (4) Space isolate (Review of documentation, 24, 1957, 18-28). The isolates in space facet have generally to be formed topologically and not quantitatively. It requires testing, improvement, and being placed on a firm footing. No scheme gives a fully detailed list of political and administrative divisions of all countries. This must be done.

3 ENERGY FACET

31 Common Isolate

Literary warrant brings out that most of the energy isolates needed in depth classification for documentation are common isolates. Some of these figure most in Natural Sciences. Others figure most in Social Sciences. It is conjectured that their total number may not exceed 4,000. Micro literature should be systematically scanned to list the posteriorising common energy isolates. A study of this list will disclose helpful ways of making filiatory groups and sub-groups of them. Once this grouping is made in the idea plane, the work in the notational plane will be easily done with Group Notation. (Ranganathan: Prolegomena to library classification, ed 2, 1957, sec 368 and its subdivisions). Probably the average number of digits in the ultimate isolate numbers may be only 3 in CC and 4 in UDC. An extensive scanning of micro literature and the establish-
ment of a schedule of common energy isolates may require about 2 man-years.

32 Special Isolate

Most of the special energy isolates are quasi-common isolates in the sense that they are amenable to the Canon of Seminal Mnemonics. In other words, though the term denoting an isolate idea in the context of different subjects may be different, the identity of the isolate idea at the deeper seminal semantic level of all the subjects is recognisable. Therefore, it can be denoted by the same isolate number in all subjects. This would make the amplification of Zone 2 of an energy schedule comparatively easy. It can be left to the autonomy of individual classifiers even. Work should be done to construct such a seminal schedule in all its fullness. There is an Indian tradition that isolates in this deep seminal level had been spotted out and fitted with notation in some earlier age. But I have not yet been able to get at this. The help of Indologists - particularly specialists in tantra literature - should be sought. The residue of the special energy isolates will be very small.

4 MATTER FACET

41 Common Isolate

Properties and values figure large in micro subjects. It is helpful to review them as posteriourising common energy isolates. It is conjectured that their number may not exceed 10,000. If a schedule is constructed for them, it will give great relief in the depth classification of micro subjects. Pilot work was done on it last year. It has been found that its schedule can be constructed easily by applying the Canon of Scheduled Mnemonics. In CC, we have only to change the Roman capitals representing main classes into the corresponding Roman smalls. There are also a few principles to be arrived at in respect of the overlooking of some of the facets in the main classes used. The zone notation is found particularly helpful in certain cases. Side by side with deriving the schedule of common isolates from the schedule of special isolates for the basic classes as indicated above, micro literature also should be systematically scanned, to discover any properties and values that may escape the a priori sweep suggested above. This work may require 3 man-years. Now that thought is being turned on the special requirements of the classification of social sciences, part of this schedule dealing with values will be of considerable help.

42 Special Isolate

There should be an over-all master schedule of matter isolates. This will have to include all raw materials, ultimate commodities, all stages of intermediate commodities, and all services. Their number may be of the order 10^40. The work done in the notational plane of CC is such that all the findings in the idea plane can be implemented. The only work to be done is scanning macro and micro literature and making a list of all materials and services. The Customs Authorities have done some spade work in the field. Their list can form the starting point. It is estimated that this work will require about 100 man-years. The results of this work belong essentially to the idea plane. They will therefore be of use for incorporation in any scheme of classification including UDC. Now that thought is being turned on the special requirements of the classification of Social Sciences, this schedule will be of use not only in Economics but also in the part of Sociology dealing with antefacts. If it is completed, depth classification will get great relief. For much can then be left to the autonomy of individual classifiers.

5 PERSONALITY FACET

51 Common Isolate

Little work has been done on posteriorising common personality isolates. They may not far exceed 100. By a systematic scanning of micro literature, a list of these can be made. If this work in the idea plane is completed, the work in the notational plane will be simple. Most of the original sources and other archives of the various kinds of bodies - governmental and non-governmental - with all degrees of ramification will need this. If it is completed, depth classification will make the classification and organisation of such source materials easy.
Therefore in addition to FID bodies interested in Social Science research should also help an early completion of this project.

52 Special Isolate

The special isolates in the personality facets will be many. Even the special isolates of Zone 2 - that is special isolates to be enumerated - will be many. The building of their schedules will have to be a continuing piece of work, in the light of the literary warrant developing from time to time. In CC, the need for a formal schedule can be by-passed to a large extent, with the aid of the Canon of Scheduled Mnemonics and the Canon of Seminal Mnemonics. However, much has to be done to make full use of these aids. Some guiding principles should be got. Probably, they will have to be got by empirical methods. It is not impossible to fit UDC also to take advantage of a similar approach.

53 Environmented Entity

The behaviour of an entity varies with environment. In a new environment, it has to be treated as if it were a new entity. I have called it Environmented Entity. It figures much in micro literature. The first study of the problem will be found in my Classification of enumerated entity: (Report 8 of FID/CA, General Theory of Classification, 1958) (Review of documentation, 25, 1958, 122-127). There, environment was treated as if it were another facet. According to the further work done in the subject, this does not give helpful results. The helpful result as reviewed from the idea plane, can be got only by treating the environmented entity as a new brand of the original entity of the normal or favoured environment. In other words, an environmented entity should be treated as if it were a sharper focus of the original in its own facet. In the array of brands, environmented entities should have precedence over the brands themselves. This is got by the superimposition of the environment isolate over the original isolate. This finding in the idea plane is easily implemented in the notational plane of CC. The environment isolate should be got normally by subject device.

The helpfulness of this way of treating an environmented entity needs to be tested and confirmed. While most environmented entities are personality isolates, some may be matter isolates.

54 Telescoped Facet and Array

To secure economy in notation, the personality facet has often to be telescoped one or to be made of a telescoped array. Telescoping will cause economy in the coding for machine search also. Not only consecutive arrays in a facet can be telescoped but also facets belonging to consecutive levels can be telescoped (Prolegomena to library classification, ed 2, 1957, sec 367). The telescoping technique is still in the infant stage. It presents many problems for investigation and solution. Most of them belong to the notational plane. One such problem concerns the telescoping of energy facet and personality facet. This has been brought out in sections 8231 and 8232 of my Depth classification (19) Classification of management (Annals of library science, 3, 1956, 33-85).

55 Ineffability of Personality

There is a difficult problem to be pursued in the future. It is concerned with the recognition of an isolate as a personality isolate. This is made difficult by three causes. In the first place, a personality isolate is often got by chronological device or geographical device. When geographical device is used, the isolate term used to denote the personality isolate is identically the same as the one used to denote a space isolate. This has produced a wrong, but deep, tendency in mind to look upon the personality isolate concerned as a space isolate. For example, when we speak of History of England, England is unconsciously taken to denote the geographical area England - i.e. a space isolate. But in reality it stands for the community living in England - a personality isolate. The same wrong tendency exists to a smaller degree in respect of chronological device. Secondly, energy and matter also may officiate as personality in some cases, as time and space do.
Classifiers can be easily made to get over these two difficulties by practice. But the third difficulty is deeper. It requires considerable insight to distinguish between personality and matter isolates. This distinction depends on the context of the host-class. For example, in the context of carpentry, 'Chair' is personality. It is only the 'Timber' or the 'Steel' or the 'Aluminium' of which it is made, that is matter. But in the context of metallurgy or chemistry, 'steel' and 'aluminium' have to be taken as personality. There are cases which are not even as easy as this. At present, personal demonstration is necessary to develop the necessary insight and reflex action into this delicate decision. Much work remains to be done to put the solution of this problem on an objective basis. Some criteria should be evolved to identify an isolate as a personality isolate or any other isolate in a given subject-context.

6 POSTULATES AND PRINCIPLES

61 Postulational Approach

As stated already in section 1, several thousands of micro documents call for classification every year. Many of them embody new micro subjects. It is impracticable to make a schedule for them in anticipation. It is tantalising to choose consistently one of the several millions of the possible sequence of them as a preferred helpful sequence. It is equally tantalising to find, by special reasoning in each case, to find a helpful place for them among the already existing subjects. This leads to a confusion. Even the choice of the sequence of the micro subjects should be mechanised — and not merely the maintenance of a preferred sequence. This has been made possible by postulational approach to classification. This approach has been actively pursued during the year under report. In this approach work in the idea plane, the verbal plane, and the notational plane is based on a respective set of postulates. A definite procedure of severe steps is prescribed for the facet analysis of any subjects in the idea plane and for the facet synthesis in the notational plane. The postulates and the associated principles are such that in the resulting classes numbers throw the subjects in a helpful filialatory sequence in a consistent way — in other words, mechanises the choice and sequence of subjects.

62 Steps in Classification

Probably we may begin with a demonstration of classification according to postulational approach.

620 Step 0: Raw Title

*Effect of a dosage of 5 cc of C367 every two days for dog-bite*.

6204 Explanation

Raw title is the title found in the document.

621 Step 1: Expressive Title

*Effect of injection* of a dosage of 5 cc of *the vaccine* *C367* with a periodicity of two days *for curing* *the disease* *of the central nervous system* *caused by virus from* dog-bite *in Medicine*.

6214 Explanation

1 The following kernel terms have been inserted along with their auxiliaries within quotes to make explicit the basic class and the isolates omitted in the raw title but implied in it.

Injection  Disease
Vaccine  Central nervous system
Periodicity  Virus
Curing  Medicine

2 "Medicine" really stands for the basic class dealing with human body.

622 Step 2: Kernel Title

*Effect injection 5 cc Vaccine C367 Periodicity of two days curing disease central nervous system Virus Dog-bite Medicine*. 
6221 Explanation

1 Auxiliaries are omitted
2 Only the kernel terms are retained
3 'Medicine' is the basic term
4 The other terms are isolate terms
5 Each of the terms denotes a facet of the subject of the document.

623 Analysed Title


624 Stage 4: Title in Transposed Form


6241 Explanation

1 By postulate, (BC) occupies the first place
2 By postulate, [T] should come in the last round
3 But there is now no objective principle to fix the position of a common isolate such as 'Effect'. It is left to our vague semantic sense. It is added after [T]
4 Or perhaps, it is wrong to take 'periodicity' of two days' as a manifestation of the fundamental category Time qua Time. In other words, the analysis in Step 3 is perhaps wrong.
5 The sequence of the other facets is the result of the analysis in Step 3.
625 Step 5: Title in Standard Facet Terms


6251 Explanation

1 A Standard term is the one found in the schedule of classification. If it does not occur in the schedule, the terms of art in usage is to be used.

2 'Dog-bite' has been replaced by 'Dog'.

3 'Curing' has been replaced by 'Therapeutics'.

4 'Effect' has been replaced by 'Fact' (which is got by experiment and observation).

626 Title in Facet Numbers


6261 Explanation

1 The facet numbers are according to the Colon Classification.

2 The number for 'Dog' is not in the schedule. It has been constructed in accordance with the Canons of Classification.

3 In the schedule, 6 is Serum, therapy. It is now proposed to use 6 to denote Antigen and Antibody collectively. 63 is now improvised for Vaccine, which is Antigen. 62 will be used for Serum, which is Antibody.

4 C367 is the code symbol used for a specific vaccine. Its use is equivalent to the use of Alphabetical Device.

5 In 635, it is taken that cc is the favoured unit in measuring vaccine. Therefore, no unit digit is inserted between 3 and 5.

627 Step 7: Class Number


6271 Explanation

1 The connecting symbols have been prefixed to the facet numbers according to postulate.

The resulting class number is the Colon Number - that is, the translation of the name of the subject into the Colon Classificatory language.

631 Idea Plane

The following are the provisional postulates for the Idea Plane:

1 Personality, Matter, Energy, Space and Time are the five fundamental categories.

2 Arranged in the decreasing sequence of their relative concreteness, the five fundamental categories fall in the sequence of Personality, Matter, Energy, Space and Time.

3 Basic classes are those enumerated as such by the scheme of classification.

4 Anteriorising common isolates are those enumerated as such by the scheme of classification.

5 Every subject includes a basic class. It may also include isolates each of which is a manifestation of one and only one of the five fundamental categories, and also anteriorising common isolates.

6 A subject may include many rounds of manifestation of the fundamental categories, Energy, Matter, and Personality.

7 Space and Time isolates can normally occur as manifestations of Space qua Space and Time qua Time, only in the last round of a subject.

8 A subject may include many levels of manifestations of the fundamental categories Personality and Matter within any round and manifestations of Space and Time in more than one level in the last round. The levels of Personality within a round occur consecutively.
So also with the levels of Matter, Space, and Time.

As pointed out in category 3 of sec 6241, the postulate 7 requires examination in the cases when helpful sequence requires that a common energy facet should succeed time facet.

6321 Colon Classification

The following are the postulates forming the basis of the work in the notational plane in the Colon Classification:

1 The connecting symbols to be inserted before an isolate number are as shown below:

<table>
<thead>
<tr>
<th>Nature of Isolate</th>
<th>Connecting Symbol</th>
<th>Read in words as</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personality Isolate</td>
<td>,</td>
<td>Comma</td>
</tr>
<tr>
<td>Matter Isolate</td>
<td>;</td>
<td>Semicolon</td>
</tr>
<tr>
<td>Energy Isolate</td>
<td>:</td>
<td>Colon</td>
</tr>
<tr>
<td>Space Isolate</td>
<td>.</td>
<td>Dot</td>
</tr>
<tr>
<td>Time Isolate</td>
<td>.</td>
<td>Dot</td>
</tr>
<tr>
<td>Anteriorising</td>
<td>Nil</td>
<td></td>
</tr>
</tbody>
</table>

2 The ordinal value of any connecting symbol should be smaller than that of any substantive symbol - i.e., a digit occurring in a basic number or an isolate number.

3 Arranged in the increasing sequence of their ordinal values, the connecting symbols fall in the sequence 0 , ; ; . -

4 The digits in each of the conventional groups - such as alphabets, numerals, etc used in a scheme of classification have their conventional ordinal values.

5 Arranged in the increasing sequence of their ordinal values, the three conventional groups of digits fall in the sequence of Roman smalls, Indo-Arabic numerals, and Roman capitals.

6 The ordinal values of the starter bracket "(" is greater than that of Z; and the ordinal value of the arrester bracket ")" is smaller than that of 0.

7 The ordinal value of each Greek letter brought into use is defined ad hoc, such that its place is adjacent to the Roman capital which is its phonetical equivalent.

6322 Generalisation

In sec 71 of his paper 'Grammar of depth classification' (Ann lib sc 5, 1958, 122-131), S Parthasarathy has suggested the following seven postulates for adoption by an analytico-synthetic classification:

1 The digits in each of the conventional groups - such as alphabets, numerals, etc used in a scheme of classification have their conventional ordinal values.

2 The conventional groups used fall in a definite sequence.

3 The ordinal value of each additional symbol brought into use is defined ad hoc.

4 The ordinal value of any connecting symbol is smaller than that of any substantive symbol - i.e., the digit occurring in a basic number or an isolate number.

5 The ordinal value assigned to connecting symbols for Personality Isolate, Matter Isolate, Energy Isolate, Space Isolate, and Time Isolate is such that it secures the arrangement of subjects according to the Principle of Increasing Concreteness.

6 A Personality Isolate Number, immediately following a basic Class Number, need not be preceded by its connecting symbol.

7 The digits used for Anteriorising Common isolates have anteriorising quality.

64 Work to be done on the Postulates

The postulates for the idea plane are working satisfactorily. The postulates of CC of the notational plane are also working satisfactorily. But the postulates of UDC for the notational plane need considerable revision. The revision is possible. Even in the idea plane, there are some difficult situations transcending the capacity of the present postulates. It needs examination whether the difficulty is due to inadequate insight in the identification of personality isolates and their distinction from the other isolates, or whether there should be some additional postulates. This has been brought out in Explanation 4 of Section 6241.
Principles for Assignment to Rounds and Levels

So far, only four principles have been formulated to help the assignment of an isolate to the appropriate round and level. They are successively

1 Whole-Organ principle
2 Later-in-Time principle
3 Act-and-Action-Actor principle; and
4 Entity-Source principle

Work to be done on the Principles

The helpfulness of these principles should be tested extensively. There are many cases beyond the capacity of these principles. Such cases are more numerous in Social Sciences. In those cases, we depend on a vague semantic feeling. New principles should be discovered. Some may be discovered empirically. Others may be derived from the psychology of thinking. The different syntactical arrangements of the kernels of a sentence, in different languages, hide the principles to be derived from the psychology of thinking. Moreover, the psychology of thinking is not yet well-developed. Till this work is done, it may be difficult to get a priori principles for unerring assignment of isolates to rounds and levels. But perhaps, the proportion of such difficult cases is comparatively small. Perhaps, these cases can be isolated and decided upon by the profession as a whole empirically in a tentative way.

Semantic Problems

Level of Fundamental Terms

Another baffling problem is determining the semantic level to which a composite term or idea should be broken down and re-expressed in terms of the fundamental constituent terms and ideas belonging to that level. We can only speak in analogies here. Take the letters of the alphabet. To express all the words, we can have an alphabet of 10 letters, 360 letters, 1,000 letters or even a million letters. But there is an optimum number. The Roman alphabet comes near it. But it is not as good as we wish it to be. Equally difficult is the problem of finding the optimum semantic level. It has for the time being to be got only by trial and error. This amounts to saying that the number of facets which could be seen in a subject and the number of arrays needed in a facet to accommodate a particular isolate are left to flair.

Can any objective principles be found to replace flair? If so, classification as well as machine language will be helped. There is also the idea of a basic class and main class. This too needs to be put on objective basis. Perhaps one way to decide whether a subject is a basic class is to examine if it can be derived from the already postulated basic classes either by the addition of facets germane to it or by the addition of phases.

Touching the Seminal Level

Though a higher semantic level is needed to make the schedule easily intelligible in the verbal plane, it will be possible to touch the deeper seminal level in the idea plane and the notational plane. If it is done, it will be possible to establish a very small number of short seminal schedules. This can form the master scheme. It will carry in a potential form every possible schedule at the conventional semantic level. The function of the brief schedule in the seminal level will be comparable to the function of the ultra-microscopic gene in genetics. The construction of the conventional schedule at a higher semantic level, in terms of the jargon appropriate to each basic class, with the aid of the seminal schedule, will give far better consistent results. This will make coding for machine much easier than at present.