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Array Change or Level Change ?

(Teaching of library science. 2).

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Reports discussions in two classes extending over three hours conducted by Dr Ranganathan in DRTC during the month of July 1964. Familiarises the class with the method of differentiating between the Universe of Wholes and the Universe of Organs. Illustrates the use of the Whole-Organ Principle to resolve homonym in (CN). Justifies, on the basis of the Law of Parsimony, the deviation from the Whole (IN)-Organ (IN) Principle in the schedule of Medicine.

ABBREVIATIONS USED

(AD) = Alphabetical Device	[1P] = First Round First Level of [P]
CC = Colon Classification	[1P2] = First Round Second Level of [P]
(CN) = Class Number	[2P] = Second Round of [P]
(CS) = Connecting Symbol	[2P1] = Second Round First Level of [P]
[E] = Energy Facet	[I] = Isolate
(I) = Isolate	[S] = Space Facet
(IN) = Isolate Number	P1...P8 = Participant 1...Participant 8
P1...P8 = Participant 1...Participant 8	[T] = Teacher

1 Familiarising the Whole Organ Idea

T.—Let us consider a universe of Whole bicycles of different makes such as Army, Hercules, Norton, Philips, Raleigh, etc; and for different kinds of riders such as child, lady, gentleman. We want to classify this universe of bicycles. What are the characteristics available ?

P3.—By Maker and by Kind of Rider.

T.—Construct a schedule for classifying bicycles by these two characteristics taken in succession.

(Silence for a few minutes).

1A ANNOTATION

The class met with a difficulty in the Organ Schedule in Chap 'L Medicine'. They found '2 Digestive System' and '21 Mouth', without a comma inserted between '2' and '1' though 'Mouth' was an Organ of 'Digestive System'. The class had to be shown under what conditions, the (CS) could be omitted between a Whole (IN) and an Organ (IN).

11 ALPHABETICAL DEVICE

T.—In the Notational Plane, what device will you use for representing Makers—Enumeration or (AD)?

P5.—(AD)

T.—Why?

P6.—Because alphabetical arrangement of the makers will prove as helpful as any other.

(Then he writes the schedule on the blackboard, as follows).

A Army

H Hercules

P Philips

R Raleigh

T.—Use the kind of Rider as the second characteristic for further classifying these isolates. In the Notational Plane what device will you use to represent the kinds of riders?

P1.—(AD)

T.—What are the conditions for using (AD)?

P2.—Condition 1. No other arrangement will be more helpful than (AD).

P7.—Condition 2. There should be an international nomenclature for the entities.

T.—Is there an international nomenclature to denote child, lady, gentleman?

P1.—No. (AD) cannot be used.

12 MNEMONIC DEVICE

T.—How will you fix the sequence of kinds of riders, then ?

P8.—By enumeration.

T.—Random enumeration ? or Is there any already existing pattern which you can follow ?

(Silence for a few minutes).

P1.—1 is mnemonic for 'child'.

T.—To find mnemonic digit for 'lady' and 'gentleman'—turn to the Medicine Schedule.

P7.—Now we get it.

55 Female

56 Male

We shall use 5 to represent 'lady' and 6 for 'gentleman'. The mnemonic digits automatically fix the sequence.

12A ANNOTATION

Though the class had become familiar with the concept of 'Mnemonics', a period of three months did not prove sufficient to bring it to the level of Reflex Action. It has therefore to be reminded obliquely.

13 FULL SCHEDULE

Write the full schedule using the two characteristics in succession.

P3.—(Writes on the blackboard)

A	Army	H5	Lady
A1	Child	H6	Gentleman
A5	Lady	N	Norton
A6	Gentleman	N1	Child
H	Hercules	N5	Lady
H1	Child	N6	Gentleman

T.—The two characteristics used land us in sub-classes made of whole bicycles.

14 PRINCIPLE OF BOTTOM UPWARDS

T.—Let us next use organ of first remove as characteristic. What will be the schedule of organs of remove 1 of a typical cycle. What principle will you follow in arranging the Organs?

P4.—Principle of Bottom Upwards.

T.—Where is it mentioned?

P3.—Sec 084 of *Colon classification*, ed 6 (1960).

T.—Write the schedule.

P5.—(Writes on the blackboard)

- | | |
|---------|----------|
| 1 Wheel | 4 Seat |
| 2 Axle | 5 Handle |
| 3 Frame | |

T.—We shall accept this provisionally for our present purpose. For convenience, let us represent the host class bicycle by the symbol [B].

2 Homonym

T.—What will be the (CN) for 'Children's Raleigh Cycle'.

P6.—[B]R1

T.—Give the (CN) for 'Wheel of Raleigh Cycle'.

P4.—[B]R1

P7.—No, Sir. This creates a homonym. R1 is already used for Children's Raleigh Cycle.

T.—What then should be the (CN) for the Wheel of Raleigh Cycle.

P3.—[B]R, 1

T.—Why?

P6.—Wheel is an Organ—that is, a Non-whole.

Raleigh is the Make. It denotes the Whole bicycle.

The (I) 'Raleigh' belongs to [1P1] that is—Level 1; and the (I) 'Wheel' belongs to [1P2]—that is, Level 2. These are two different Levels or two different Facets of [P].

∴ a comma (,) should inserted between their respective (IN) R and 1.

T.—Thus we get [B]R,1 for "Wheel of Raleigh Bicycle".

3 Principle of Whole (IN)-Organ (IN)

T.—Generalise the result.

P7.—A comma (,) should be inserted between the (IN) forming the Facet of Whole and the (IN) forming the Facet of Organ in the (CN) of a subject.

T.—Let us call this the "Whole (IN)-Organ (IN)" Principle.

3A ANNOTATION

Dictating a General Principle, without our helping the students to discover it, will not be effective. In the first place it will not be meaningful; it may be boring. Secondly, it will not help them to make the Principle their own and apply it later.

4 Application to Organ Schedule in Medicine

T.—Let us apply to Medicine, this principle for a succession of Whole and Organ facets in the notational plane.

Take the Whole "2 Digestive system". Write on the black-board the schedule of its subclasses.

P3.—Writes

21	Mouth	24	Stomach
22	Pharynx	25	Intestine
23	Esophagus		

T.—I say that the principle of "Whole (IN)-Organ (IN)" is violated in the above schedule. Do you agree?

P7.—Yes.

T.—Why?

P8.—“2 Digestive System” is a Whole. “1 Mouth” is an Organ of the Digestive System. Therefore, the (IN) for “Mouth” should be “2,1”.

T.—CC has then made a mistake, a horrible mistake! Is it not?

(Silence for a few minutes).

P3.—We should not jump to conclusions so hastily. There may be some reason behind the CC schedule.

T.—Discuss among yourselves, as usual at the corridor, at the dinner table, in your walks and so on. Find out the real reason behind this apparent fault in the Medicine schedule of CC. We shall continue our discussion in the next class.

4A ANNOTATION

Giving opportunity for group discussion without the intervention of the teacher is helpful and even necessary, to prepare the students to receive a new idea.

* * * *

40 APPARENT MISTAKE

T.—Last time we adjourned with a problem. P4, can you tell me what the problem is?

P4.—Last time we found that in the Medicine schedule in CC the Principle of Whole (IN)-Organ (IN) is violated by the omission of the (CS) (,) between the digits 2 (Digestive System) and 1 (Mouth). At first, we thought that CC had made a mistake. But, we were in doubt whether CC was wrong. We were asked to discuss this problem.

T.—That is right. Have you found any solution?

P's.—Yes. We have.

41 SOLUTION 1

(P8, gives his reasons in sentences uttered almost in one breath).

T.—When we are solving a problem, it is helpful to imitate what is done in proving a geometrical proposition or solving a geometrical problem.

Each statement should be in a simple sentence with unity of thought.

Different statements should be in different paragraphs.

Wherever necessary, “A carry-forward” term such as **therefore**, (\therefore), or **because**, (\because) should be prefixed to a statement.

Above all, it is helpful to write these statements. It will help us in concentrating our thought on the problem. Further, writing will make us exact and—shall I say—as responsible as a man of science should be.

P8.—(Writes on blackboard, three sentences)

1 Mouth is a part of the Digestive System.

2 It itself forms a [P].

3 \therefore No (,) should be inserted between the “2” representing “Digestive System” and the “1” representing “Mouth”.

T.—Is there any fallacy in this argument?

P4.—Yes, there is.

T.—What is it? Find out.

(Silence for a few minutes).

T.—There are three statements here. Examine each one of the statements. And then locate where the fallacy lies.

P5.—The Statement 1 reads, “Mouth is a part of digestive system”.

T.—Is it a correct statement?

P's.—Yes. There is nothing wrong here except that we would use ‘Organ’ instead of ‘Part’.

P6.—Statement 2 reads, “It itself forms a [P].”

T.—Is it a correct statement?

P3.—It is a statement added unnecessarily. It is implied in Statement 1 itself. It is, therefore, redundant.

P7.—But it is necessary to emphasize it. Therefore, it is required.

T.—There is no need for emphasis here. Once a statement is made, it should not be repeated in intellectual work. Otherwise, we shall be wasting our time without any solution. Now, P8 has not expressed his thought clearly. He has omitted an important statement. What is it?

(Silence for a few minutes).

T.—He has forgotten to quote the Principle just now formulated.

P4.—That is the Whole (IN)-Organ (IN) Principle.

T.—That is right. Where will you put it?

P2.—As Statement 2.

T.—P8, write your argument correctly. I shall help you. (P8 goes upto blackboard and writes, T dictates)

1 Mouth is an organ of the Digestive System.

2 We should insert a comma between Whole (IN) and Organ (IN).

P8.—(Hesitatingly) Then my original Statement 3 is not correct.

T.—Do you see it now? Anyway write your old Statement 3 on the board, so that others may also understand it.

(P8 writes).

3 ∴ no (,) should be inserted between 2 (the (IN) of Digestive System) and 1 (the (IN) of Mouth).

T.—I hope you now see the fallacy.

41A ANNOTATION

Students should be accustomed to thinking slowly, deliberately, and expound the reason for each step in thinking. This is facilitated by making them write out their arguments, according to the pattern made familiar to them in Pure Geometry. This enables the students to discover fallacies in argument.

42 SOLUTION 2: ANALOGY 1

T.—Is there any other solution?

P4.—I have one solution.

T.—Write it on the blackboard.

(P4 writes).

1 As an analogy we shall consider [S].

2 'Madras' is a part of 'India'

3 Therefore (CS) should be inserted between 44 (the (IN) of India) and 1 (the (IN) of Madras).

4 But it is not inserted in the [S] of CC.

T.—This is not a solution. It is only an analogy. P4, has only shown us another place where we have not inserted (CS) between Whole (IN) and Organ (IN). Your task is to find out the reason behind the trick of omitting a (CS) between Whole (IN) and an Organ (IN). It has been done intuitively under pressure. There must be some reason behind it. Let us try to bring it out.

43 SOLUTION 3: ANALOGY 2

P4.—I have another argument.

T.—Please write it on the board.

(P4 goes to the blackboard and writes).

Between [E] and [2P], no comma is inserted.

∴ there is no need for inserting ',' between 2 (the (IN) for Digestive System) and 1 (the (IN) for Mouth).

T.—Who will counter-argue this ?

P3.—The omission of ',' between [E] and [2P] is according to a postulate—namely the Postulate of Omission of (CS) [Ranganathan (S R). Elements of library classification. Ed 3. 1963. Sec J71].

T.—Why is it postulated ?

P3.—To satisfy the Law of Parsimony.

T.—It is not the correct reason. If you play into the hands of the Law of Parsimony for this simple reason, you may omit

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2 Standard for presentation of schedules of classification.
3 Standard for subject heading.

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(Sd) A NEELAMEGHAN,
Signature of Publisher.

many digits in a (CN).

P5.—Here it is. It is given in Sec 0566 of the *Colon classification*. Ed 6. 1963.

(All the students pick up that page, P5 reads)

“Generally speaking, if the [E] (IN), initiating a round, will always consist of the same number of significant digits, the connecting symbol of the [P] (IN) following it may be omitted.”

T.—That is the right reason.

P8.—It is not clear to me.

T.—Will any one of you explain this to P8?

P3.—1 We are concerned with [E] and [2P].

2 The [E] (IN) will always have only one rich digit.

3 ∴ a rich digit coming after it cannot belong to [E].

4 ∴ it can only belong to [2P1].

5 ∴ it is unnecessary to insert a (CN).

T.—Can you generalise the reason? It is not just the Law of Parsimony taken by itself.

P5.—Insertion of a comma would amount to the repetition of one and the same idea.

T.—Use one word for this idea and state the principle using it.

P7.—Insertion of a comma would cause Redundancy.

T.—This is the right reason for omitting the (CS) between [E] and [2P1]. The omission of comma between Whole (IN) and Organ (IN) is not covered by the Postulate cited.

Now, P6, you give your reason.

P6.—(Writes)

Zone 2 in (A1) is unoccupied in the [1P].

It is occupied in the [2P].

(He then adds “I am confused”.)

43A ANNOTATION

There is a general tendency in a beginner to apply a primary basic principle such as the Law of Parsimony, without circumspection. He should be

helped in as many situations as possible, to realise the conditions precedent to be satisfied for such a general principle to be brought into use.

5 Right Explanation : Unitary Universe of Wholes

T.—I shall help you to think further. Remember that a ‘,’ had to be inserted in the case of the Universe of Bicycles, between Whole (IN) and Organ (IN), in order to avoid homonym. You have seen this the other day.

Will a homonym arise if comma is omitted between the Whole (IN) and the Organ (IN) in the case of ‘Digestive System’?

(The class is silent)

T.—Look at it from another angle. The Universe of Bicycles includes many Kinds of Bicycles. Therefore, we can have several (1) made of Whole Bicycles—one for each Kind. It is so, because the Universe of Bicycles is a Multiple Universe, in the sense that there are many Kinds of Bicycles. Is the Universe of Digestive System in the body of man a Multiple Universe, in the sense that there are many Kinds of Digestive System in the bodies of men?

P7.—I see it now. The Universe of Digestive System in the body of man is a Unitary Universe.

T.—State it in terms of Whole (IN).

P3.—There can be only one Whole (IN) when the Universe is Unitary. In this case, the Whole (IN) cannot be amplified by the addition of any digit to give the (IN) for a Subuniverse of Wholes of One Kind only.

T.—To put it in a more colourful way, the (IN) for Whole in a Unitary Universe of Wholes is ‘Frozen’.

∴ The Whole (IN) in this case can only be ‘2’. Any digit, added after it, cannot lead us to a Whole (IN).

∴ It can only represent an Organ (IN).

∴ the Principle of Redundancy will be violated if we insert a (CS) between ‘2’ representing the Unique Whole Digestive System and ‘1’ representing the Mouth, an Organ of the Unique Whole Digestive System.

Let us generalise this for future guidance.

If the Universe of Wholes is Unitary, a (CS) need not be inserted between the Whole (IN) and the succeeding Organ (IN).

When the Universe of Wholes is Multiple, if we change over in the idea plane from one level of facet to another, we should change over similarly from one level of facet to another in the notational plane also. But, when the Universe of Whole is Unitary, though we change over in the idea plane from one level of facet to another, in the notational plane it is sufficient to change over from one order of array to another within the same facet. In other words, we need not put the connecting symbol between the (IN) of organ, so as to mark of the organ (IN) as another level of fact. This effects a saving of digit in the (CN). For a classificationist and a classifier the saving of even one digit is a source of joy even as the saving of one phoneme is a source of joy for a grammarian—as much joy as the birth of a son gives to the parents.

It will be a good exercise for you to examine all the schedules in CC and find out where this Principle can be applied and is applied. Take it as the subject of a paper to be done after the course ends. But before tomorrow, examine the Organ schedule in Chapter L and list all the cases where the Universe of Wholes is not Unitary but Multiple. For, you must know how to deal with such cases in constructing the schedule.

5A ANNOTATION

This is again a case of helping the students to find a solution to a particular problem, instead of the teacher dictating the solution. The teacher should also help the students to generalise their particular solution.