

## CHAPTER - X

### DEDUCTIVE AND VERIFICATION PHASES

When a revolutionary theory is founded it is sustained by a strong faith rather than by any deductive or inductive reasoning. Ultimately a theory is only considered valid when its applicability to the real world is established.<sup>1</sup>

A fundamental quality of a hypothesis is that it should be verifiable. Therefore the fourth quadrant of the spiral has been set to verify the hypothesis. As already said, no amount of experimentation can verify a theory or a hypothesis. Verification is indirectly done through the deduced principles. Therefore, the process of formulating a normative principle does not end with its enunciation. We descend the spiral in clockwise direction. The consequent activities in the quadrant are:

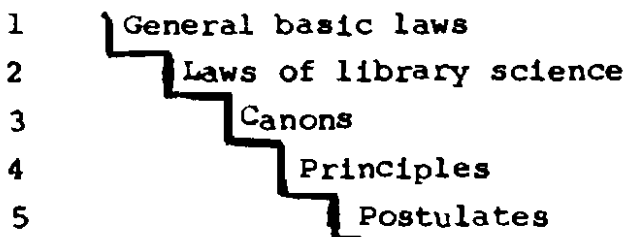
- " 1 intellect is used either by itself or aided by machinery constructed to speed up the work of the intellect and give relief to it in some measure;
- " 2 reasoning is made with the aid of deductive logic including general semantics, and mathematical and other calculuses to work out all the compelling implications of the fundamental laws;
- " 3 There is progression towards particularisation, and regression from generalization;
- " 4 there is progression towards concreteness and regression from abstractness; and
- " 5 the deduced laws are derived and recorded;

- 6 the derived laws include one and all of the inducted empirical laws; and
- 7 the number of deduced laws exceeds that of the empirical laws, if the fundamental laws had been seized with intuition of adequate intensity.<sup>2</sup>

As already explained in the preceding chapters the implications of the five laws are numerous and the book Five laws with explanations embodies details of them. By way of their implications as well as their validity, Ranganathan deduced guiding norms for different branches of the discipline. Ranganathan enumerates the hierarchy of guiding norms at different levels as follows:

- |                     |  |
|---------------------|--|
| 1. Basic Laws       | Applicable to the whole Universe.      |
| 2. Fundamental laws | Applicable to a discipline.            |
| 3. Canons           | Applicable to a branch.                |
| 4. Principles       | Applicable to a sector of a branch     |
| 5. Postulates       | Working assumptions to begin the work. |

Diagrammatically the hierarchy can be presented by descending stairs:



Such methods are sometimes called hypoductive methods. Since these normative principles from canon onwards have been derived

from the preceding higher normative idea so these conform to the principle of the "Unity of idea" or dip principle. In the legal parlance, it is called "Stare decisis". It means whatever is true of one guiding form, is ipso facto true of what ensues from it and occupies lower position in the hierarchy.

For theory of any branch, or discipline Ranganathan inevitably looks towards the Five laws to deduce applications applicable to that area. To deduce some canons from the laws while sitting in a cloister is an a priori technique. It is the work of a rationalist who believes that mind can work out relationships which are then found to occur in nature. Verification of laws consists in coming with their workable deductions. Ranganathan had always an insatiable urge to elucidate the laws from the variety of aspects. Begotten on the laws his scientific work forms a single whole, each book furthering the plot.

Canons and principles become the normative principles of a lower order. Postulates are the starting points - convenient assumptions based on long working experience. They cannot be verified. Logically they are irreducible. Even though they cannot be deduced from any prior supposition, yet they do not come from wishful thinking. These assumptions are deep rooted and founded on long trains of induction and deduction, yet these are pro tem. Let us take the example of always debated

postulate of the five fundamental categories. This assumption cannot be verified precisely or quantitatively but the assumption is working so far. Many practically tenable results have been obtained on this assumption. One way to prove such postulates is the negative approach - if it cannot be disproved then it is valid. When confronted with the question as why there are only five fundamental categories and why not three or six, like a true scientist Ranganathan answered:

There is absolute freedom for everybody to try it out. A person may be found of six. He must classify on that basis some thousands of assorted articles. If they produce satisfactory results in arranging the subjects of the articles along a line; that postulate may be accepted. This is not a matter to be argued ex-cathedra without such a thorough and prolonged try out. Working on the basis of five fundamental ideas has produced satisfactory results...4

This is one of the test of verification. On the same procedure the postulate of facet sequence has also been verified - placing the onus to disprove on the sceptics or contenders. He warns that arm-chair doubts form a trivial approach which is rather destructive.<sup>5</sup>

The foregoing argument describes the status of a postulate. Canons of classification and cataloguing, and the messages in book selection have been obtained from the five laws by a a priori method. However, in the Book selection (1962) these deduced principles are explicitly simple. Reviewing Ranganathan's Book selection D W Langridge observes that

"of all the author's work it is one most explicitly based on the five laws. They are examined in turn and made to yield the most detailed implications for book selection".<sup>6</sup> His deductive process is so simple that starting from the core without any preconceived ideas, we can grasp all the rules and their implications. In the same vein, Ranganathan always advised his students to think ab initio from the first principles - his way was Socratic in procedure studded with concrete examples. To demonstrate how to think, Ranganathan initiated a series of articles enumerating the implications for a specialist library deduced from the fundamental principles, and these constitute Ranganathan's testament on special and industrial libraries and tell much about his thinking process. One only needs to be adept in deductive logic, that follows from his arguments.

Verification of a scientific theory is a sine qua non to qualify it to be admitted to the house of knowledge. No theory, however, abstract and based on sound principles, is considered tenable for long if it is not verified at the first opportunity. Realising the importance of verification of results in a research enquiry Ranganathan allotted one complete quadrant to the verification process. It constitutes the fourth phase of the spiral. Indeed, verification is an integral part of the research process to generate valid knowledge. It is a productive as well as creative phase. It is the last but not the closing phase, for the spiral is endless.

Verification always results in new developments of knowledge and keeps the spiral moving. Ranganathan has always been anxious for thorough verification of his views and results:

Postulates are based on the united experience gained on floor duty and on conjectures on the normal way of thinking - especially the second set of postulates dealing with the sequence of facets. Foskett's paper in International Conference on Scientific Information (1958, Washington, DC) endorses the helpfulness of these postulates. But it is desirable to examine their helpfulness more extensively by empirical observation of reader's reactions. Perhaps they may be examined a priori by psychologists particularly by specialists in the psychology of thinking.<sup>8</sup>

Library science is a social science and like all other social sciences the verification of results is very difficult and a very long drawn process. It is rightly said that in such sciences it is easy to create a theory than to prove it - it accounts for different schools of thought. Man is inescapably complex, and an intractably mixed mass of emotions and reasons. In man, it is impossible to agunder apart the head from the heart. Numerous variants in man's behaviour cannot be isolated or put in a test tube and titrated. Mathematical tools and social calculus, though emerging, are still at a primitive stage. Signs are there of their development. We cannot assign numerical coefficients to human nature or to different aspects of human behaviour and measure it quantitatively. Man has a wee bit longer time span, therefore, collection of data takes centuries, and cannot be taken by one

observer. Observation is always subjective and interpretations more so as man is both the observer and the observed. Personal errors inevitably creep in; and judgements have built in bias. Man has the capacity to pretend and feign and to mask the truth about himself. For all these reasons verification, too, is difficult and uncertain.<sup>9</sup>

Some of the deductions are already verified empirically so they need not undergo another testing ordeal. Some others may be self evident - as they bring out what we have already fed in them. Ranganathan tested the validity of his theories at the altar of their workability. At bottom Ranganathan's vision was intensely practical attests B C Vickery.<sup>10</sup> Commending the practicability of the Prolegomena, Krishan Kumar comments that his theory is "beautifully married to the practice".<sup>11</sup>

It is rightly said that hypothesis is tested not by the realism of its assumptions, but by its ability to predict accurately and explain.

An easy way to verify a theory/law is to test the validity of its implications and deductions. In this context, it is significant to quote Encyclopaedia Americana:

In scientific contexts, hypothesis are seldom capable of direct test but are tested indirectly by deducing consequences that are directly testable. When favourable, the tests are said to confirm the hypothesis. Strictly speaking no hypothesis is ever exhaustively confirmed, for it is capable of an indefinite number of tests, only a few of which are actually performed.<sup>12</sup>

Many new laws revealed have already existing corresponding practices without any explicitly known theory. When the deductions supply an explanation of an already existing practice they stand verified. This is called the post-diction verification. The CC was conceived intuitively in 1924. "Experiment was made from 1925 onwards with the growing collection of the Madras University Library starting from 32,000 volumes."<sup>13</sup> Thus, it was made free of the defects inherent in existing classifications. It was further applied on thousands of books before the second edition was published in 1939. It further straightened many kinks.

Ranganathan even advocated industrial methods for testing:

In an industry, no commodity is sent out before it is tested and certified. This should be done in the case of intellectual commodities also, including schedules for depth classification. Firstly, we should use methods of testing developed in sociology and statistics. For, we have masses of readers on the one side and masses of literature on the other. Secondly, we should have controlled observation. Thirdly, correct statistical methods should be used in the design of tests and digesting and interpreting the results of observation. Fourthly, the margin of error should be estimated. Fifthly, we should use for the test only classification scheme conforming to the latest design and certified to be so by the person or the team who designed it.<sup>14</sup>

Stressing the importance of verification, he writes elsewhere:

Though the law is reached by what seems inspired imagination, it must be tested and criticised by the discoverer in every conceivable way, till he is certain that his imagination has not played him false, and his law is in real agreement with the

whole group of phenomena which it condenses. As Ramanujan, the mathematician once said to a friend who flattered him to be a genius, "come and see me at night when I waste midnight oil in testing the accuracy of my formulae."<sup>15</sup>

In a mostly applied science like ours the theories are tested every time. The moment it slackens it is considered outmoded. In a revolutionary moment it is thrown, as a junk, but usually, it is modified to fit the latest observations made. One acid test of verification is the number of critical followers a theory has. Fanatic adherents may even create a school of thought. Ranganathan's theory of classification is more or less synonymous with the general theory of classification. Some of the devices of the C C, for example, sectorising device, have been used in other classification systems, such as the U D C. The C C is being used as a basis for studying the foundations of a general theory of classification. The FID/CA (later renamed as FID/CR) provided a forum to discuss and consequently test his theories. Aslib and FID/CR convened an International Study Conference on classification for information retrieval in 1957 at Dorking (England). There the Ranganathan approach was evaluated, appreciated and declared it to be the age of faceted classification.<sup>16</sup>

The Classification Research Group (CRG) London even made faceted classification for information retrieval as its manifesto.<sup>17</sup> The CRG though having some differences with Ranganathan

views has considerably furthered his theory of classification. Many faceted schemes for specialised subjects have been forged. Even manuals have been published to design faceted classification based on Ranganathan's methods.<sup>18</sup> His widespread practical use of the chain indexing in B N B (till 1971), and I N B, and other national bibliographies; use of Colon classification and the classified catalogue code are obvious and straightforward verification of his ideas. It is not only a compliment to his genius but also an indirect but sure method of verification and confirmation of his theories: Imitation is the sincerest flattery.

For testing his ideas, Ranganathan most of the time discussed them with friends, and colleagues. His morning walks during his stays at Madras, Delhi and Bangalore are remembered as walking conferences wherein new ideas were hit upon and also discussed with colleagues for their verification. Sometimes new but half-formed ideas were published in a technical note form in some library periodical. Favourable comments even criticism is a measure of the degree of their tenability.

To play with abstract concepts was Ranganathan's passion. He was a dreamer with wild imagination. But he always sought the support of his ideas from the groundwork. His supporting base is as wide and deep as high his imaginations. But for the attestation of his ideas, he did not merely depend on his

imagination. Like a true scientists, he created sometimes laboratory conditions for verification attests J Mills.<sup>19</sup> Bernard Palmer always found Ranganathan testing his theories against the realities of what Wyndham Hulme called 'literary warrant'.<sup>20</sup> Palmer makes another significant remark in this context by affirming that Ranganathan's theories are "tested at every point against the realities of information retrieval: all this abstraction issues ultimately in a very concrete form...."<sup>21</sup>

Every rule in the Classified catalogue code was put on trial in the court room of the class. The class acted as a mock court.<sup>22-23</sup> Thus teaching provided him another opportunity to verify his ideas. Teaching and other means of disseminating thoughts and information are other modes of testing them. A teacher always imparts objectivity to the ideas in the course of his teaching - and teaching always and constantly improves and corrects one's ideas. Ranganathan's long teaching span provided him a great opportunity to verify his ideas and convictions. Pauline A Cochrane very aptly writes that the Madras Library Association School (later taken over by the Madras University) and library schools at Banaras and Delhi, were the laboratories "for Ranganathan to propound his ideas in library science based on the laws, and study the reaction of students".<sup>2</sup> Cochrane further says that the Madras University Library was "his other laboratory for testing the effectiveness of library

techniques designed by himself in terms of the reaction of readers. The blending of the findings from the two kinds of tests enabled Ranganathan in a great measure to formulate, elaborate and refine most of his basic ideas in almost all facets of library science....<sup>25</sup> Commendations from students and peers verify his ideas and prove their reality. Verification also helped refine his methods constantly, as it the case with every scientist.<sup>25</sup> Verification of results and discovery of new ideas always go hand in hand. Verification and the observation quadrants in the spiral seem overlapping. But when new data is collected and new experiments are made and we reach the nadir again the jump is qualitative.<sup>27</sup> This also leads to development research. He was in an advantageous position of being a theoretician as well as a practitioner; that provided an objective correlate to the ideas, he put forth.

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