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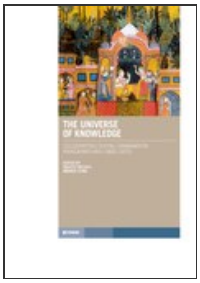

Fausto Freschi e Andrea Cuna

Shiyali Ramamrita Ranganathan (1892-1972): An Introduction

Abstract: This introductory essay explores the soil in which the roots of Ranganathan's work grew, by investigating the educational background, cultural ties, and social context that may have influenced Ranganathan's activities as a scholar and library scientist. The main aim is to provide a general and critical overview of the cultural origins and philosophical foundations of Ranganathan's work with particular reference to his Indian sources. In this regard, it is worth stressing that, beyond what can be derived from biographical accounts of Ranganathan's life, the most convincing evidence on his cultural background is provided by Ranganathan's references to the classical texts of Indian culture and philosophy. This introductory essay does not engage in a full presentation or critical analysis of any important issues related to the Library and Information Science field. Rather it is an attempt to recontextualise Ranganathan's scientific legacy within the framework of his cognitive roots. On the one side, this can lead to gain a broader and more holistic perspective on his ideas, notions, methodologies, and theories about knowledge. On the other side, it can also lead to insights on the methodological implications involved in designing faceted information systems.
Keywords: S.R. Ranganathan, Hindu tradition, Colon Classification, Information Science, Scientific method

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FARE srl con socio unico Università di Udine
Forum Editrice Universitaria Udinese
via Larga, 38 - 33100 Udine
Tel. 0432 26001 / Fax 0432 296756 / forumeditrice.it

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Abstract

This introductory essay explores the soil in which the roots of Ranganathan's work grew, by investigating the educational background, cultural ties, and social context that may have influenced Ranganathan's activities as a scholar and library scientist. The main aim is to provide a general and critical overview of the cultural origins and philosophical foundations of Ranganathan's work with particular reference to his Indian sources. In this regard, it is worth stressing that, beyond what can be derived from biographical accounts of Ranganathan's life, the most convincing evidence on his cultural background is provided by Ranganathan's references to the classical texts of Indian culture and philosophy. This introductory essay does not engage in a full presentation or critical analysis of any important issues related to the Library and Information Science field. Rather it is an attempt to recontextualise Ranganathan's scientific legacy within the framework of his cognitive roots. On the one side, this can lead to gain a broader and more holistic perspective on his ideas, notions, methodologies, and theories about knowledge. On the other side, it can also lead to insights on the methodological implications involved in designing faceted information systems.

1. Preliminary Remarks

Over the last fifty years, Shiyali Ramamrita Ranganathan's work as library scientist and his outstanding achievements in the fields of Library Science and documentation have been widely investigated and commented upon. His most notable contributions include: (1) the Five Laws of Library Science, widely regarded as the definitive exposition of the ideal of library service; (2) the postulate on fundamental categories (these being five and only five: Personality, Matter, Energy, Space and Time), which contributed to the development of a new way of thinking about the analysis of compound subjects, their separation, and their sequence; and (3) the Colon Classification (CC), an analytico-synthetic system based on the concept of facets. For all this, Eugene Garfield – the father of bibliometrics – significantly wrote that "Ranganathan is to library science what Einstein is to physics" (Garfield 1984b: 46).

However, Ranganathan's most significant and enduring contribution is the theory and technique of facet analysis as a conceptual approach to knowledge organisation. Facet analysis represented a major conceptual paradigm shift from the top-down approach used by traditional classification systems, marking a new trend in the library classification and becoming an indispensable standard for revising traditional library classification schemes in a more modern and rigorous sense (Miksa 1994: 152):

> The work of 20th-century library classificationists and, principally, of S.R. Ranganathan permanently changed the course of library classification, particularly in the form of faceting techniques which have become standard for it. These changes have been applied to older schemes in increasing amounts of rigor – in the DDC (17th-20th editions, 1965-1989), in the UDC (2nd Engl. ed., 1985), in a vastly revised version of Bliss' scheme called BC2 (beginning in 1976), and even in the newest edition of the CC itself (7th ed., 1989).

In more recent years, it was with the emergence and rise of information architecture in the global landscape of the Web that facet analysis acquired a renewed value, becoming the most relevant de facto standard for information organisation in several fields and applications of today's digital information landscape, wherein traditional tools and techniques of classification appear to be somewhat outdated, due to the fact that digital objects and related information resources on the Web need not be physically classified, but only conceptually organised (Broughton 2006: 61):

> It is also the case that faceted classification has itself become an important method of information organisation and display on the web. […] The logical and predictable structure of the faceted system undoubtedly makes it compatible with the requirements of mechanisation in a way that enumerative and pre-coordinated systems are not. Even where linear order is not a major consideration and the aspects of the classification related to combination and display of compounds are very much secondary, the simplicity and logic of the faceted approach is appealing.

While there is still a considerable focus on the theoretical and technical findings of Ranganathan's work, his cultural, spiritual and philosophical background is still waiting to be adequately highlighted in order to better understand some of the definitions and proposals related to his knowledge system, its analysis, and its organisation. As Kumar wrote: "His works were punctuated with similes drawn from the various epics, *puranas*, and *shastras*. When it was the question of reference service, he referred to *Ramayana*; he related the five laws to Lord Narayana; Documentation to *Kurmavatara*; and so on" (1986: 220). It is therefore necessary to consider Ranganathan's cultural, philosophical and religious

background in order to highlight the crucial function of the Hindu tradition that played a key role in the formulation of the principles of his knowledge organisation; and also to investigate some fundamental aspects of his systematic approach to knowledge and its forms of acquisition. In other words, in order to fully understand the sense and meaning of Ranganathan's proposal, it is necessary to widen the field of research to issues that fall within the area of competence of Indology, not in a general way, but from a perspective of inquiry firmly rooted to the premises and background that oriented, also in a methodological and technical sense, his education[1].

We have focused our attention primarily on those parts of Ranganathan's work in which there is an evident association between Library Science topics and his Indian cultural context without claiming to describe in detail each individual work we have considered. Undoubtedly, mathematics was also an important component in Ranganathan's classificatory thinking. However, as Miksa acknowledged, Ranganathan was "a complex person who comprehended a variety of approaches to classification, the rationality and logic associated with mathematics being only one such aspect" (1997: 167 n. 1)[2].

Among those who profoundly influenced Ranganathan's thought were the brilliant mathematician Srinivasa Ramanujan (1887-1920)[3], to whom he dedicated a biographical monograph several years after Ramanujan's death, and S. Kuppuswami Sastri (1880-1943)[4], professor of Sanskrit and comparative philology at the Madras Presidency College, and curator of Oriental manuscript collections, to whom he was indebted for an epistemological perspective based on a unified conception of knowledge (*eka-vākyatā*) of Vedic origin (Ranganathan[5] 1952b: 13-14):

> That impression had been given a name by another respected friend of mine Mahamahopadhyaya Professor S. Kuppuswami Sastriar. That name is *Ekavakyata* (= Unity). He used to say that all knowledge was one. The Vedas form, in a sense, a single

[1] On the hypothesis of an influence from the Nyāya-Vaiśeṣika system see for example Adhikary & Nandi 2003, Mazzocchi & Gnoli 2010.

[2] On Ranganathan's mystic rationalism see Dousa 2019: 169-171.

[3] Born into a Brahmin family in the town of Erode near Kumbakonam in Tamil Nadu, Srinivasa Ramanujan was one of the most remarkable mathematicians of modern India. His contributions were in the areas of number theory, elliptic functions, continued fractions, and the transformation of infinite series (Hardy 1937).

[4] S. Kuppuswami Sastri was a renowned scholar in various fields of Indological research: Vedānta, Mīmāṃsā, Nyāya and Vyākaraṇa. He was curator of the Government Oriental Manuscripts Library at Madras and editor-in-chief of the monumental *New Catalogus Catalogorum* (Gode 1943: 279-281).

[5] Henceforth = R.

> sentence. So does every chapter of it form a single sentence; and of course every sentence in it is a single sentence.
> When Providence transferred my field of interest from Mathematics to Library Science, this *ekavakyata* tradition of the Vedic ancestors, demonstrated in daily life by my Professor, came with me. When I spent a year wandering amidst diverse libraries in Great Britain in 1924-25 to prepare myself for my new life, the light of this *ekavakyata* principle was disclosing the minutest imaginable details in library practice. It illuminated each of them, and at the same time threw them into a coherent whole. I felt the *ekavakyata* pervading all that I saw in the British library world and all that I read in the splendid library on Library Science found in the School of Librarianship of the University College, London. I still find it guiding me in all my thought and life. I often realize that even apparently trivial occurrences are organically fused into a single life-experience. Occasionally when immersed in thinking out ideas, all the long years of life fuse into a single moment. Such is the potency of *ekavakyata*.

It has not been possible to explore every aspect of Ranganathan's work, but only to focus our attention on some fundamental issues of his thought, such as the distinction between intellect and intuition, the relevance of the mystical dimension, the spiral of the scientific method, as well as conceptual tools such as "seminal mnemonics" and "absolute syntax", which in some way originated from the basic principles of Hindu philosophical tradition[6].

The analysis method and the information management system proposed by Ranganathan have had a huge impact on the modern knowledge organisation, and are widely used on the Web as a privileged approach to information architecture. His figure and work have become a point of confluence and convergence of different subject areas and disciplines within the larger frame of the digital humanities.

2. Early Period (1916-1928)

There are three significant phases in Ranganathan's early life: the first is the formative years during which his intellectual training was shaped; the second is inspired by the personality and ideal teaching of the brilliant mathematician Srinivasa Ramanujan; while the third is characterised by the scientific and professional foundations acquired during Ranganathan's stay in Great Britain.

[6] Ranganathan set his system of thought within the context of Neo-Hinduism. Among those who have attempted to reinterpret the meaning and identity of the Hindu tradition in the modern world, Wilhelm Halbfass included Rāmakṛṣṇa, Vivekānanda, Ramaṇa Maharṣi, Aurobindo, Rabindranāth Tagore, and Sarvepalli Radhakrishnan (1990: 218).

2.1. Formative Years

Shiyali Ramamrita Ranganathan was born on 9 August 1892 to Ramamrita Ayyar and Sitalakshmi in Shiyali, a village in the Tanjore district of the Madras Presidency, in present-day Tamil Nadu. Belonging to a family of orthodox Brahmans, he had a good knowledge of ancient Hindu texts. His early education was imparted by Anantharama Ayyar and Thiruvenkatachariar, who introduced him to Sanskrit literature and the mysticism of the Āḻvār and Nāyaṉār, the Tamil poets famous for composing devotional hymns to Viṣṇu and Śiva from the 7th to the 10th century (R. 1961: 19-20; Gopinath 1986a: xxviii).

In high school years Ranganathan was influenced by Subramanya Ayyar, principal of Hindu High School in Shiyali and a scholar of the Bengali yogi, philosopher, and poet Śrī Aurobindo (1872-1950)[7]. In Ranganathan's works, Śrī Aurobindo was a privileged reference among the *guru*s of modern Hinduism, as were Śrī Rāmakṛṣṇa Paramahaṃsa (1836-1886), the Bengali saint devoted to the goddess Kālī[8], and Ramaṇa Maharṣi (1879-1950), the sage of Aruṇācala[9].

Ranganathan completed a B.A. in mathematics at Madras Christian College in 1913 and an M.A. in the same college in 1916 under Edward Burns Ross (1881-1947), who had studied at Cambridge with Godfrey Harold Hardy (1877-1947). After qualifying as a teacher at Teachers' College, Saidapet, Ranganathan began his career in 1917 as a lecturer in mathematics at Government College, Mangalore, and later from 1920 to 1921 at the Government College, Coimbatore (Gopinath 2003: 2419-2420).

From 1921 to 1923 he worked as an assistant professor at the Madras Presidency College, where he taught algebra, physics, statistics, and trigonometry. His interest in mathematical research in these early years is evidenced by papers

[7] Aurobindo Goshe was born in Calcutta to a Bengali family of the *kāyastha* caste and educated in England, where he studied in London and Cambridge. On his return to India, he became secretary to the Maharaja of Baroda and joined the nationalist movement in 1902. In 1910, after spending a year in prison, he took refuge in the French colony of Pondicherry, not far from Madras, where he remained until death (Phillips 1986: 1-2).

[8] The priest of the Dakṣiṇeśvara temple in Calcutta, Śrī Rāmakṛṣṇa Paramahaṃsa, born Gadādhara Caṭṭopādhyāya, had a great influence on several personalities in modern India, including Śrī Aurobindo, Rabindranāth Tagore, and Sarvepalli Radhakrishnan. He regarded all religions as expressions of a single truth. His favourite disciple was Swami Vivekānanda, who represented Hinduism at the Parliament of the World's Religions in Chicago in 1892. On Rāmakṛṣṇa's model of religious pluralism see Maharaj 2018: 88-100.

[9] Ramaṇa Maharṣi, born Venkaṭaramaṇa Ayyar, was born into a middle-class Brahmin family in Tamil Nadu. At the age of sixteen, he had a spontaneous spiritual experience that radically changed his life. He retired to Tiruvaṇṇāmalai, at the foot of the sacred hill Aruṇācala, where he remained for the rest of his days. On the life of Ramaṇa Maharṣi see Mahadevan 1965: 129-148 and Grimes 2012: 1-28.

until 1921 in the journal of the "Indian Mathematical Society" in the area of "correspondence theory in the general real of Theory of Numbers" (Miksa 1998: 65). Later Ranganathan wrote a series of biographical sketches of mathematicians and scientists – from Paracelsus down to Ramanujan – for "Current Science", a multidisciplinary scientific journal founded in Bangalore in 1932 (Dasgupta 1967: 15).

The general aspects of mathematics in Ranganathan's classificatory thinking can be identified in three main areas: "those that consist of mathematical calculations; those that focus on mathematics as a field; and those which by their very nature speak to Ranganathan's orientation to mathematical thinking – in short, his recourse to the idea of a postulational method and his constant reference to 'ordinal' numbers" (Miksa 1997: 168).

There are also some specific mathematical concepts belonging to the theories of groups, sets and transformations, as well as "his analogical use of the idea of infinity" (Miksa 1997: 174). Many elements formulated by Ranganathan since the 1930s, such as the concept of the infinity of knowledge and the theory of the subject, can be appreciated on the basis of the mathematical perspective of infinity: "Ranganathan developed a theory of *the universe of subjects* inspired by the mathematical works of Georg Cantor (1845-1918) in relation to the idea of infinity" (Hjørland 2013: 546).

2.2. The Ideal Teacher

During his years as an assistant professor at Presidency College, Ranganathan was fascinated by Srinivasa Ramanujan, whose contributions to number theory were remarkable. After Ramanujan's death, the University of Madras planned to publish his papers and, as a tribute to him, it was decided to include a biographical sketch at the beginning of the volume. In 1923 a committee appointed by the University of Madras gave Ranganathan the task of preparing a draft, which was completed in December 1923 (R. 1967c: 16)[10].

Whether Ranganathan was merely a compiler or wrote the entire biographical sketch, the fact is that the text was approved by the committee and published in 1927 under the names of P.V. Seshu Aiyar and D.B.R. Ramachandra Rao in the volume *Collected Papers*, edited by Bertram Martin Wilson, Godfrey Harold Hardy and Seshu Aiyar himself (Berndt 2019: 5).

[10] Some obituaries had already been published. The first, written by Hardy, was published in "Nature" (1920: 494-495). In the same year it was reprinted in an issue of the "Journal of Indian Mathematical Society" with two other obituaries by Rao (1920: 87-90) and Aiyar (1920: 81-86). These were followed by an obituary in "Nature" by Eric Harold Neville (1921: 661-662).

The sketch highlighted Ramanujan's qualities by mentioning some significant episodes in his life: from his formative years to the correspondence with Hardy, from his time at Cambridge to his nomination as a Fellow of the Royal Society, and concluded by emphasizing Ramanujan's religious view (Hardy & al. 1927: xviii-xix):

> He had a special veneration for the Namakkal goddess. Fond of the *Puranas*, he used to attend popular lectures on the Great Epics of Ramayana and Mahabharata, and to enter into discussions with learned pundits. He believed in the existence of a Supreme Being and in the attainment of Godhood by men by proper methods of service and realisation of oneness with the Deity[11].

How relevant Ramanujan's ideal teaching was to Ranganathan is evident from a biography he published forty years later, with the intention of spreading as much knowledge as possible about his figure and work (R. 1967c: 10). Entitled *Ramanujan. The Man and the Mathematician*, the volume is interesting in several respects. On the one hand, it provides valuable information testifying to the ideal relationship between Ranganathan and Ramanujan, such as Ranganathan's meeting in Oxford with Hardy and the recovery of the "missing notebook"; on the other hand, it also contains themes of Indological interest already present in Ranganathan's earlier works.

The volume consists of an introduction (A), sixteen chapters (B-S) and an index. What surprises the reader in chapter B, significantly entitled "Ramanujan: a Puzzle", is the assertion that "some of the information collected for this biography and the earlier one by me is of a trans-rational nature" (R. 1967c: 13). The references include two revelatory dreams, one of Ramanujan and the other of his mother, a tragic horoscope, and other events. Among these Ranganathan recalled a rather singular one that occurred in Madras in 1934, when Ramanujan was invoked by K.S. Krishnaswami Ayyangar, a prominent Madras lawyer and later High Court judge. Using a "Ouija board" (also known as a spirit board), he was asked about the contents included in his third notebook, receiving this reply: "I now remember. I was working on Mock-Theta Function" (R. 1967c: 16). In chapter C, "Super-Activity Period 1: 1907 to 1911" referring to Ramanujan's first notebook, he wrote: "Surely, all this could not have been seized by the intellect alone. Intuition should have played a large part in this period of super-activity. Ramanujan was indeed a *Drashta* (= a Seer) in Mathematics" (R. 1967c:

[11] Before leaving for Cambridge in January 1914, Ramanujan went to the Narasimhaswamy Temple in Namakkal (Tamil Nadu) to ask the goddess Namagiri, to whom he was devoted, for permission to travel to England. At that time, his mother had a dream in which she saw her son surrounded by distinguished Europeans. The goddess Namagiri herself would have ordered her to allow her son to go to England (Berndt 1989: 237).

22). In chapter E, "University Setting", speaking of Ramanujan's shyness and humility, Ranganathan quoted directly from the *Rāmāyaṇa*, the epic poem he particularly loved: "The correct term to describe this quality of Ramanujan is the Sanskrit word *Hri* in the sense in which Valmiki used it in evaluating Rama" (R. 1967c: 32).

To Ramanujan's notebooks Ranganathan devoted the entire chapter L (R. 1967c: 55-60). After Ramanujan's death, his papers – including two notebooks – were acquired by the University of Madras. When Ranganathan was writing his biographical sketch, he found a reference to another notebook "having been left behind by Ramanujan in Cambridge" (R. 1967c: 55). During Ranganathan's stay in England in March 1925, he met Hardy in Oxford in order to get some insight into this remarkable document. In an anecdote, entitled "Recovery of the 'Missing Notebook'" he recalled this meeting and the recovery of the missing notebook, which had been copied in Madras and sent to Hardy as desired by him (R. 1967c: 56-57).

Chapter M "Reminiscences of Friends" is dedicated to the testimonies of some of surviving friends (R. 1967c: 61-91). They all emphasised Ramanujan's virtues, in particular his religious attitude. For example, the pleader C.R. Krishnaswami Ayyar asserted that Ramanujan was familiar with *kuṇḍalinī* and Patañjali's *Yogasūtra* (R. 1967c: 68)[12]; the advocate K. Narasimha Ayyangar recalled his interest in astrology and Vedānta philosophy (R. 1967c: 70); the retired accountant general T.K. Rajagopalan ascribed his deep mathematical insights to the grace of god Narasiṃha (R. 1967c: 87)[13]; and with reference to Ramanujan's mystical side R. Srinivasan, a retired professor of mathematics, attributed to him the following statement: "Sir, an equation has no meaning for me unless it expresses a thought of GOD" (R. 1967c: 88).

Chapter N, "Ramanujan, the Man", deals specifically with the subject of intuition, which Ranganathan regarded as distinct from intellect and flair (R. 1967c: 97-99). In support of his thesis he referred to a terminology of the Advaita Vedānta school, already introduced in other of his works, and quoted a statement ascribed to the great philosopher Śaṅkara (R. 1967c: 99):

> No more stilted partial description of the Lord, catching word after word by laborious search through the darkness of the intellect. The light of intuition has now begun to bathe the personality of the Lord. Hereafter, I must merely describe what I *see*.

[12] The text refers to Arthur Avalon, the pseudonym of John George Woodroffe, a judge in the Calcutta High Court from 1904 to 1922 and the author of several works on the Tantric tradition.

[13] According to Hindu tradition, Narasiṃha occupies the fourth place in Viṣṇu's list of ten *avatāra*s (*daśāvatāra*).

For Ranganathan, Ramanujan's symbolic metaphysics was of interest, especially the relationships he established with the mathematical concepts of zero and infinity (R. 1967c: 101):

> He would symbolize God and the existents or entities of the phenomenal world symbolically as follows: God as the Absolute is Attributeless (Nirguna-Brahman). In this view, 'Zero' may be taken to represent God. God is also the Abode of all Attributes (Sarva-Guna-Asraya). As such God is Sa-Guna. In this view 'Infinity' may be taken to represent the infinity of attributes found in and along with their Abode. The combinations of the Infinity of Attributes, taken any one or any two or any three, etc. at a time, is itself infinite. Each combination of the Absolute and of one of the Infinity of combinations of the Attributes appears to us as an existent or entity in the phenomenal world. This corresponds in symbols to the product of 'Zero' and 'Infinity' being indeterminate and thus admitting itself to be taken to yield any one of the infinity of numbers. Thus, the phenomenal world of the past, present, and future is represented by the product of 'Zero' and 'Infinity'[14].

Only a few years earlier Ranganathan had related the ancient insight of the Vedic seers to the research on infinity of contemporary mathematicians (R. 1964: 15):

> According to a Vedic statement if infinity is taken away from infinity, then infinity itself will be left as residue. This represents the intuitive grasp of a certain experience by the seers of yore. In recent years, the intellectual work of mathematicians has led to the statement of the same result as a Postulate about Infinity[15].

In Ranganathan's vision, religious experience belonged to the domain of intuition, unlike philosophical knowledge, which belonged to the domain of the intellect. Ramanujan was interested in both domains (R. 1967c: 100):

> In philosophy he was fascinated by the Atheistic Sankhya School of Philosophy. On the other hand, his behaviour was as if he had experienced God – not the God, the Absolute – but a manifestation of God. The manifestation nearest to him was Namagiri.

For Hardy, Ramanujan "was no mystic", but an "orthodox high-cast Hindu" (Hardy 1937: 139). This interpretation, which in Ranganathan's view stemmed

[14] In the non-dualistic (*advaita*) school of Vedānta, the Supreme Being (*Brahman*) is characterised as having qualities (*saguṇa*) or not having qualities (*nirguṇa*). The identity of *ātman* and *Brahman* can only be defined in negative terms, "neither this nor that" (*neti neti*).

[15] The reference is to *Bṛhadāraṇyaka Upaniṣad* 5.1: *pūrṇam adaḥ pūrṇam idaṃ pūrṇāt pūrṇam udacyate*; *pūrṇasya pūrṇam ādāya pūrṇam evāvaśiṣyate* (Rigopoulos 2015: 104 n. 8).

from a misunderstanding of the true nature of religious experience, marked a point of disagreement with the British mathematician (R. 1967c: 100):

> Whatever be the manifestation, the religious experience is the realization of the Absolute. It is in this sense that Ramanujan should have told Hardy that all religions seemed to him more or less equally true. Unfortunately, this should have led Hardy to infer that Ramanujan's religion was a matter of observations and not of intellectual conviction. Hardy even suspected that he was an Agnostic. In fact, religious experience is not a matter of phenomenal observations or of intellectual experience. It is trans-phenomenal and trans-intellectual.

In chapter P, "Ramanujan, the Mathematician", Ranganathan deals with the problem of the authenticity of Ramanujan's ideas by quoting Hardy's *Ramanujan* monograph (R. 1967c: 108-110) and offers an overall assessment of his work in the words from Joseph John Thomson's *Recollection and Reflections* (R. 1967c: 116-117). In this chapter, special emphasis is given to Ramanujan's last letter to Hardy a few months before his death, in which reference was made to the "Mock-Theta Function" (Zagier 2009: 143). Ranganathan writes about this (R. 1967c: 116):

> The last and perhaps the only letter written to Hardy by Ramanujan after his return to India is dated 12 January 1920. In this letter he speaks of "Mock-Theta Function". He gives in that letter a list of such functions up to order seven.

2.3. The Stay in England

A turning point for Ranganathan came in January 1924, when he gave up his teaching activity at Presidency College and assumed the position of Chief Librarian at Madras University. Having received no training, he went to England to learn more about the library techniques used in the West. In London, Ranganathan came into contact with W.C. Berwick Sayers (1881-1960), Chief Librarian of the Croydon Public Library and lecturer at the University School of London, to whom he presented his ideas, later formulated in his early works, *The Five Laws of Library Science* and *Colon Classification*, published in 1931 and 1933, respectively[16]. An account of Ranganathan's stay in Great Britain is given in *A Librarian Looks Back: An Autobiography of Dr. S.R. Ranganathan*, published after his death in 1992, edited by Prithvi Nath Kaula.

[16] In 1918 W.C. Berwick Sayers had published *An Introduction to Library Classification, Theoretical, Historical and Practical, with Readings, Exercises and Examination Papers*. The second edition published in 1922 also included *A Short Course in Practical Classification*, published separately in 1913 (Bliss 1936: 88).

Soon after his arrival in London, Ranganathan was easily admitted to the School of Librarianship at University College. There he attended only the professional classes – including library organisation, library administration, bibliography, library classification (theory and practice), library catalogue (theory and practice) – having been exempted from taking classes in language, literature and archives. However, the benefits of formal library education were not particularly significant. Since what he had learnt so far was not enough, he asked for practical work in the library (R. 1992: 33-42).

After completing his training at Croydon Public Library, Ranganathan undertook a tour of major libraries in the London area and in Scotland. Among the libraries he visited were those in Islington, Glasgow, Birmingham, Cambridge and Edinburgh. In the second half of June 1925, Ranganathan left England for India, arriving in Madras in the second half of July (R. 1992: 45-52).

3. First Period (1929-1947)

At the end of his study tour in England, Ranganathan came back to Madras determined to contribute to the Library Movement that had been developing in India since the beginning of the 20th century. To promote the ideas of the Movement and to encourage the establishment of a library service in India, he formed the Madras Library Association, of which he was the founder secretary from 1928 to 1945 (R. 1957a: 23-24). Of the several volumes published in the Association's series up to 1941, the first, written by several authors, was dedicated to the library movement, while the others were signed by him: *The Library Movement*: *a Collection of Essays by Diverse Hands* (1929)[17]; *The Five Laws of Library Science* (1931); *Colon Classification* (1933); *Classified Catalogue Code* (1934); *Library Administration* (1935); *Prolegomena to Library Classification* (1937); *Theory of Library Catalogue* (1938); *Colon Classification*, second revised edition (1939); *Reference Service and Bibliography* (vols. 1-2, 1940-1941).

For Ranganathan, these were years of intense work and research, which led him to overlook the development of his inner life, to the extent that he "was thinking of retiring on a proportionate pension and was exploring the possibilities of settling down in Tiruvannamalai, where Ramana Maharshi had his *Ashram*" (R. 1992: 127).

[17] A prominent essay was *What Makes a Library Big* by Rabindranāth Tagore, the Bengali poet, writer, composer, and painter who was the first non-European to receive the Nobel Prize in Literature in 1913. For Tagore's view of the role of the library see Ray 2015.

The years from 1941 to 1947 were less productive from a scientific point of view, perhaps due to some difficulties he encountered in his working environment. However, these difficulties did not prevent him from continuing to develop his research, the results of which were included in his works *Library Classification: Fundamentals & Procedures* (1944) and *Elements of Library Classification* (1945), where "its extensive explanations of and emphases on ordinal numbers strongly suggest that a mathematical orientation was remained strongly present in his thinking" (Miksa 1997: 177).

3.1. The Five Laws of Library Science

First published in 1931, with a second edition in 1957[18], this work contains the fundamental principles of his thought. In his introduction, W.C. Berwick Sayers acknowledged its originality (R. 1931: xxv):

> This is one of the most interesting books that I have read in recent years upon our profession. It is unique, I believe, in that it attempts for the first time a comprehensive survey by a librarian who has a peculiarly Indian mind, and reflects his own racial culture on the basic theories of the art of book distribution as it is understood in the modern library world. To those who are new to our work it may be a wonder that so much can be made out of what superficially appears to be so simple a craft, but a perusal of Mr. Ranganathan's pages will take the beginner a long way along the path of enlightenment.

Eugene Garfield also emphasised the importance of this work, by stating that for Ranganathan "the five laws were a first step toward putting library work on a scientific basis. These laws provided general principles from which all library practices could be deduced" (1984a: 39).

As an epigraph to his work, Ranganathan used a passage ascribed to Manu, the legendary author of the *Mānavadharmaśāstra*, the ancient Sanskrit code of laws:

> To carry knowledge to the doors of those that lack it and to educate all to perceive the right! Even to give away the whole earth cannot equal that form of service[19].

[18] The five laws were first illustrated in 1928 in a conference of teachers held at Meenakshi College, Chidambaram (R. 1957a: 22). An explanation of the five laws of the library science with reference to the role of the book in modern society was given by Ranganathan in *Social Bibliography or Physical Bibliography for Librarians* (1952b).

[19] *yo dadyāj jñānam ajñānāṃ kuryād vā dharmadarśanam*
sa kṛtsnāṃ pṛthivīṃ dadyāt tena tulyaṃ na tad bhavet
This *śloka* is not found in the *Mānavadharmaśāstra*. However, a slightly different version is found, in the *Śāntiparvan* of the *Mahābhārata*, in one of the stanzas considered spurious in

In this first work, Ranganathan accompanied original remarks on librarianship and the importance of disseminating knowledge with references and quotations from the *Upaniṣad*s, *Bhagavadgītā*, *Rāmāyaṇa*, Tamil literature, and other sources. Sometimes he used English translations, sometimes critical editions; occasionally, the citations do not match the sources he quotes (Kundu & Biswas 2011: 170)[20]. In terms of style, here as elsewhere, Ranganathan adopted a mode reminiscent of the *sūtra* of the Sanskrit tradition[21].

Crucial to this work was the inspiration offered to him by the principle of *eka-vākyatā* of the Vedic ancestors as formulated by Kuppuswami Sastri (R. 1952b: 14):

> That book is a verbal record of the *ekavakyata* of library practice and science, as it revealed itself to me.

The five laws were as follows: 1. Books are for use. 2. Every person his or her book. 3. Every book its reader. 4. Save the time of the reader. 5. A library is a growing organism. The five laws were later translated into Sanskrit by Kuppuswami Sastri (R. & Sivaraman 1951: 17):

> *granthālayī sadāsevī pañcasūtrī parāyaṇaḥ*
> *granthā adhyetum ete ca sarvebhyaḥ svaṃ svam āpnuyuḥ*
> *adhyetuḥ samayaṃ śeṣed ālayo nityam eva ca*
> *vardhiṣṇur eva cinmūrtiḥ pañcasūtrī sadā jayet*

As for the formulation of the first law, Ranganathan recalled his indebtedness to Edward B. Ross – his mentor at the University of Madras (R. 1957a: 21-22):

> He was about to get on his motor cycle. His eyes gleamed – always a sign of his hitting something new; then came his characteristic smile of such occasions; and he said, "You mean, 'Books are for Use'; you mean that is your first law". He went away without waiting even to see my reaction; this was quite like him. But this stroke of intuition of his landed me in perfect relief. The enunciation of the other laws was automatic. About three more hours were spent in filling up five sheets of paper with deductions from the five laws. Their enunciation was thus complete.

the Pune Critical Edition (see Sukthankar & al. 1954: 2031a, ll. 152-153 [Appendix 1, No. 17B]; personal personal communication of Marco Franceschini:
ajñānāya ca yo jñānaṃ dadyād dharmopadeśanam (12.202.033d)
kṛtsnāṃ vā pṛthivīṃ dadyāt tena tulyaṃ na tat phalam (12.202.033d)

[20] Ranganathan's quotations from the *Rāmāyaṇa* correspond to the Sanskrit text with the commentary of Rāma edited by K.S. Parab (1888).

[21] On the *sūtra* tradition see Renou 1963.

The first chapter is devoted to the first law ("Books are for use"). It is a fundamental law expressing an elementary principle, from which all others are derived. To prove its immutability he resorted to a passage taken from the *Upaniṣad*s (R. 1931: 1):

> The first law of Library Science, like the first law of any other science, embodies an elemental truth. In fact, it is so self-evident that one may be inclined to say that it is trivial. But, that is an invariable characteristic of all first laws. Take, for example, the first Upanishadic law of conduct (*Satyam Vada* – speak the truth), or the first law of motion[22].

After analysing the issues "Library Location", "Library Hours", and "Library Furniture", Ranganathan devoted several pages to "Library Staff", on which the advent of the first law had "the most vital effect" (R. 1931: 34). To emphasise the importance of fair remuneration for a staff dedicated to its mission, Ranganathan quoted a verse from the *Pañcatantra* (R. 1931: 54)[23]:

> The words of the poor, however beneficial, are seldom heard.

Widening his perspective to include the social picture, he quoted the famous poet Bhartṛhari to show how human society had erroneously developed on the basis of money (R. 1931: 54-55):

> Are the majority of men guided by the ultimate value of things? "An emphatic no", is the answer supplied by that astute Professor of Worldly Wisdom, Bhartrihari. "On the other hand," says he, "He who has wealth is believed to have the bluest blood running in his veins. He is taken for a scholar. He passes for the most well-informed. He is considered the most discriminate. His power of speech is praised as unequalled. And his figure is described as the most handsome. It is the gold in his possession that settles the quality of every one of his attributes"[24].

Referring to the library staff and their responsibilities, he went on to mention the Tamil version of the *Rāmāyaṇa* written by the poet Kampaṉ and the original

[22] *Taittirīya Upaniṣad* 1.11.1: *satyaṃ vada / dharmaṃ cara* ("Speak the truth, pursue virtue").

[23] The *Pañcatantra* "The five treatises", is a collection of Indian animal fables in prose and verse, composed between 100 BC and 500 AD. Ranganathan's source was the recension called *Pañcākhyānaka* of Pūrṇabhadra, edited by Hertel 1908: 152. On Pūrṇabhadra, a Jaina member of the Śvetāmbara order, see McComas 2011: 3.

[24] Bhartṛhari, *Nītiśataka* and *Vairāgyaśataka*, 41. In footnote Ranganathan refers to Telang 1874: 11 and Gopinath 1914: 99.

Sanskrit of Vālmīki (R. 1931: 59)[25]. He then continued with a verse on the spirit of service attributed to Tāyumāṉavar, a Tamil-speaking poet and philosopher devotee of Śiva who lived during the 18th century AD (R. 1931: 71):

> If you but give me the fitness to serve my fellow-beings, the state of happiness will come to me of its own accord[26].

This was followed by a passage from the *Bhagavadgītā* (R. 1931: 73):

> Work alone are thou entitled to, and not to its fruit
> So never work for fruit, nor yet desist from work[27].

To the second law ("Every person his or her book") Ranganathan devoted a few chapters. In the second chapter, he affirms "the principle of equality of opportunity for books, of opportunity to learn and of opportunity to enjoy" (R. 1931: 151), by referring to the generous act of universal inclusion of the most prominent of the sixty-three Nāyaṉārs, the poet-saint Campantar, who lived in the seventh century A.D., and is recorded in *Periya purāṇam*[28], the great Tamil epic poem by Cēkkiḻār (R. 1931: 152):

> This last act of Sambandar would, in its expression of universal brotherhood, serve as a symbol of the Second Law of Library Science.

In the third chapter he describes the overwhelming success of "Books for all" in his conquering the world, using the Sanskrit word *digvijaya* or "world-conquering expedition" (R. 1931: 153). In the fourth chapter, he explains the implications of the second law (R. 1931: 228). In the fifth chapter devoted to the third law ("Every book its reader"), which is in some ways a complement to the second law, Ranganathan discusses the problem of finding a suitable reader for every book (R. 1931: 299).

The sixth and seventh chapters are devoted to the fourth law ("Save the time of the reader") and the fifth law ("A library is a growing organism"). This last law suggests a gradual process of growth for libraries, which could lead to new ways of disseminating knowledge. As imagined by Herbert George Wells

[25] *Rāmāvatāram* 4.8.2 and *Rāmāyaṇa* 4.33-34, respectively.
[26] Tāyumāṉavar, *Parāparakkaṇṇi*, 155. For the English translation, Ranganathan refers in footnote to Tambyah 1925: 36.
[27] *Bhagavadgītā* 2.47. Translation taken from Sarma 1930: 71.
[28] Cēkkiḻār, *Periya purāṇam* 2.1250-1253.

(1866-1946)[29], this could take place through the direct transmission of thought, in the manner of Dakṣiṇāmūrti, the manifestation of the god Śiva, who is traditionally said to teach through silence (R. 1931: 414):

> What further stages of evolution are in store for this GROWING ORGANISM – the library – we can only wait and see. Who knows that a day may not come – at least Wells has pictured a world in which dissemination of knowledge will be effected by direct thought transfer, in the Dakshinamurti[30] fashion, without the invocation of the spoken or the printed word – that a day may not come when the dissemination of knowledge, which is the vital function of libraries, will be realised by libraries even by means other than those of the printed book?

Finally, to support his thesis that the library is an instrument of universal education, aimed at spreading knowledge to all, the spirit of which persists in all its forms, similar to the inner dimension of man, he reported the words of Kṛṣṇa (R. 1931: 415-416):

> As a person casts off worn-out garments and puts on others that are new, so does the embodied soul cast off worn-out forms and enter into others that are new.
> Weapons do not cleave him; fire does not burn him; water does not make him wet; nor does the wind make him dry.
> He cannot be cloven; he cannot be burnt; he cannot be wetted; he cannot be dried; he is eternal, all-pervading, steadfast and immovable; he is the same for ever[31].

3.2. The Colon Classification

The second seminal work of the early period is *Colon Classification*. Initially developed from 1924 to 1928 and used in the Madras University Library, the classification scheme was first published in 1933 with a second revised edition in 1939[32].

Dedicated to his beloved Professor Edward B. Ross, the volume was prepared with the advice of several scholars in various fields. In the introduction of the

[29] Wells was the author of many science fiction novels, including 1931's *The Science of Life*, which he wrote with Julian Huxley and his son George Philip Wells. Ranganathan is referring to *Men like Gods* (1923).

[30] "According to a traditional verse, Siva, as Dakshinamurti, is said to sit under a banyan-tree in the midst of his disciples and to resolve all their doubts by the eloquence of his very silence" (R. 1931: 414 n. 1).

[31] *Bhagavadgītā* 2.22-24.

[32] Gopinath has conveniently grouped the seven editions into three versions in the line of evolution of the facetisation of the system (1976: 64-65): version 1 (1933-1950): rigidly faceted era; version 2 (1950-1963): analytico-synthetic era; version 3 (1963-onwards): freely faceted era (Raghavan 2015: 232 and Satija 2017: 293).

second edition, Ranganathan explains the difference between current classification schemes (Dewey and Library of Congress) and his Colon Classification, in which "ready-made Class Numbers are not assigned to topics" (R. 1939: 1.12). The original idea for this scheme came to Ranganathan during his stay in London (R. 1967b: 106-107):

> I could not then say that what was needed was a faceted classification. But something was engaging my thought continuously. While in that condition, I happened to see a Meccano Set in one of the Selfridges Stores in London. That gave me the clue. It made me feel that the class number of a subject should really be got by assembling 'Facet Numbers' found in several distinctive schedules, even as a toy is made by assembling an assortment of parts. I chose the digit Colon (:) as the connecting digit for any isolate facet. Further, this also made me feel that a subject should be analysed into facets before its class number could be constructed.

To the (:) colon symbol Ranganathan attributed a deeper meaning, derived from his mathematical background (R. 1965a: 14-15):

> The semantically rich digits used in the Colon Classification are normally a to z, 1 to 9, and A to Z. Thus the digit used to separate one facet number from the succeeding facet number should have an ordinal value less than that of one. At this juncture, the fact that zero is elliptical in shape gave a clue. According to the Geometry of Conics a point-pair may be deemed to be a degenerate form of an ellipse. This suggested that a point-pair may be taken to be a "greater zero"; in other words, as a digit with an ordinal value between those of zero and one. Sayers agreed with the idea of using (:) colon as the digit needed for insertion between any two facet numbers. This was the exciting inspiration which led to the design of a new kind of classification. It was called "Colon Classification", to emphasize the rich potential added to the scheme by the semantically poor digit (:) colon.

The second edition does not differ substantially from the first. It is divided into four parts: part I "Rules of Classification", part II "Schedules of Classification", part III "Index to the Schedules", and part IV "Examples of Call Numbers". The part III contains two sections: an alphabetic index "to the fundamental constituent terms in the Schedules of Classification contained in Part II", and an alphabetical index in the field of Indology to the "title entries and author entries of all the works, whose Class Numbers have been worked out by the Classic Device and given in the illustrative schedules of Part II" (R. 1939: 3.3). As Ranganathan remarked (R. 1939: 1.13):

> Topics in Indology have been worked out in far greater detail than in other schemes. Books on Indology are numerous not only in Indian libraries but also in many foreign libraries. The Indological schedules will also be of use in classifying Oriental Manu-

script Libraries. It is hoped to include in the next edition similar detailed schedules for other oriental subjects as well.

In this new edition schedules for ancient Tamil poetry, Jainism, Buddhism, Judaism, Christianity and Zoroastrianism were added. A new major class called "Δ Spiritual Experience and Mysticism" was also included (R. 1939: 1.16). Ranganathan took the letter Δ, which always had mystical significance from the earliest times, and placed it above the formal series of other symbols to signify its inseparability from what it represents. This main class was associated with the dimension of intuition, distinguishing it from intellection, on the basis of Vedic categories (R. 1939: 1.126):

> To call such an exposition 'irrational' may violate the Canon of Reticence, for the terms 'rational' and 'irrational' refer to the plane of intellection whereas mystic, occult and spiritual experiences do not belong to the sphere of intellectual apprehension at all but are said to involve some kind of direct (trans-intellectual) insight. Little, no doubt, is generally known about the nature or modes of such mystical apprehension; and its validity and even existence are often questioned. But it is not for the classifier to take sides in a controversy. He is simply concerned to separate literature based on sense-experience and intellection from that presuming or using trans-intellectual apprehension. In India such a distinction is traditionally recognised. Exposition based on intellection is called *kartrtantra* (experimental, analytical study of things in their phenomenal modes); and *vastutantra* (global, holistic study of thing-in-itself) is exposition based on illumination[33].

Despite being a central element at the basis of his classification system, the second edition did not include the postulate of fundamental categories – Personality, Matter, Energy, Space and Time – which was first formulated in *Library classification: Fundamentals & Procedures* (R. 1944: 429-434) and included in the fourth, fifth and sixth editions of the *Colon Classification* (Gopinath 1986b: 158).

Back to the Indological sources, we must now examine the third part, which in the sixth edition of 1960 is entitled "Schedules of Classics and Sacred Books with Special Names". It begins by thanking Kuppuswami Sastri, whose cooperation was particularly valuable for the construction of the lists. The latter included names and works from the main class L to the main class R (R. 1960a: 3.3-3.53):

[33] It is the distinction formulated by Śaṅkara in his *Brahmasūtrabhāṣya* 1.1.4 (Staal 1962: 62-63). Interestingly, this distinction was an integral part of Ramaṇa Maharṣi's teaching, of which Ranganathan was certainly aware: "Meditation needs effort: *jnanam* is effortless. Meditation can be done, or not done, or wrongly done, *jnanam* is not so. Meditation is described as *kartru-tantra* (as doer's own), *jnanam* as *vastu-tantra* (the Supreme's own)" (Talk 624 of 4th February 1939 in Ramana Maharshi 2006: 607).

L Medicine
LB Ayurveda System (3.3-3.4)
Δ Spiritual Experience and Mysticism
Δ2 Hindu (3.5)
Δ22 Hatha-Yoga (3.5)
Δ25 Bhakti-Yoga (3.5)
Δ26 Raja-Yoga (3.5)
Δ28 Siddhars of South India (3.5)
Δ3 Jain (3.5)
Δ4 Buddhistic (3.5-3.6)
Δ47 Maha-Vairocana (3.6)
Δ5 Judaic (3.6)
Δ73 Sufi (3.6)
Δ 841Chinese (3.6)
Δ 8513 Neo-Platonic (3.6)
N Fine Arts
NA Architecture (3.7)
NR Music (3.7)
NS Dance (3.7)
O Literature
O15 Sanskrit Literary Criticism (3.8-3.11)
O31,1A Sanganul (3.11-3.13)
O33,1 Kanarese Poetics and Prosody (3.13)
O35,1 Telugu Prosody (3.13)
P Linguistics
P15 Vedic and Classical Sanskrit (3.14-3.19)
P151 Prakrta (3.19)
P31 Tamil (3.19-3-20)
P33 Kanarese (3.20)
P35 Telugu (3.20-3.21)
Q Religion
Q1 Vedic (3.22)
Q2 Hinduism (Post-Vedic) (3.23-3.28)
Q3 Jainism (3.28-3.30)
Q4 Buddhism (3.30-3.32)
Q5 Judaism (3.32)
Q6 Christianity (3.32)
Q8412 Confucianism (3.32)
Q8451 Zoroastianism (3.32-3-33)
R Indian Philosophy
R621 Vaisesika (3.34-3.35)
R625 Nyaya (3.35-3.37)
R631 Sankhya (3.37-3.38)
R635 Yoga (3.38)
R64 Purva Mimamsa (3.38)
R641 Bhatta Mimamsa (3.38-3.40)
R645 Prabhakara Mimamsa (3.40)
R65 Vedanta (3.40-3.50)
R66 Advaita (3.40-3.44)
R663 Praty-abhijna (Kasmirian) (3.45)
R6634 Virasaiva advaita (3.45)
R672 Visistadvaita (Vaisnava) (3.45-3.47)
R673 Saiva Siddhantam (3.47-3.48)
R68 Dvaita (3.48-3.49)
R6891 Bheda-Bheda (3.49)
R6892 Dvaitadvaita (3.50)
R6893 Suddhadvaita (3.50)
R693 Jain Philosophy (3.50-3.51)
R694 Buddhistic Philosophy (3.51-3.53)

3.3. The Classified Catalogue Code

Published in 1934 and dedicated to W.C. Berwick Sayers, *Classified Catalogue Code* was the result of ten years of experimentation in the Madras University Library. Its publication marked a fundamental turning point in the literature and professional practice of Library Science, as the first modern example of a classified cataloguing tool. The work contains 408 rules with 579 examples and consists of a preliminary part, a main part with eight chapters, and an index.

With regards to the topic of our interest, two sections should be noted: the first on the transliteration of Sanskrit and Dravidian languages (section 041), the second devoted to Hindu names (section 1212), of which the criteria for their formation are outlined (R. 1934: 61):

> In the case of modern Hindu names, the last substantive word in the name is to be written first and all the earlier words and initials are to be added thereafter; except that, in the case of South Indian names if the last substantive word merely indicates caste or community and the penultimate word is given in full on the title page; the two last substantive words are both to be written first in their natural order.

There is also a section reserved to "Pseudonyms" (section 125), in which Kuppuswami Sastri provided a significant contribution on "Authorial Polyonymy and Homonymy in Sanskrit Literature". These are two "phenomena" of particular interest to Library Science (R. 1934: 111-112):

> Polyonymy comprises not only pseudonyms intentionally assumed by the authors themselves and nicknames waggishly given by others, but also patronymics and matronymics, names of religions lineage (gōtra-names), titles of learning, pet-names, abridged names, monachal names (names borne by sannyāsins), translated parallels and paraphrastic renderings. Homonymy comprises all the cases where, mainly as a resuIt of the ancient custom of naming persons after their ancestors, gods, goddesses, prophets, saints, distinguished authors, patrons and sometimes rulers, different persons have come to bear the same name.

Among the authors of Sanskrit literature investigated were: Vyāsa, renowned author of the *Mahābhārata*; Vālmīki, author of the *Rāmāyaṇa*; Kauṭilya, author of the *Arthaśāstra*; Kaṇāda and Gautama, authors of the *Vaiśeṣikasūtra* and *Nyāyasūtra*, respectively; Pāṇini and Patañjali, famous Sanskrit grammarians; Upavarṣa, to whom is ascribed a commentary on the *Sūtra*s of Jaimini and Bādarāyaṇa; the famous viśiṣṭādvaitin Brahmānandin also known as Ṭaṅka and Ātreya; Kumārila, author of the *Mīmāṃsāślokavārttika*; Yajñavalkya, to whom a metrical text from the *Dharmaśāstra* is attributed; the Tamil saints Appar and Nammāḻvār; the Śrī Vaiṣṇava's philosophers Yamunācārya, Rāmānuja and Vedānta Deśika; the playwright Jayadeva, the scholar Ānandagiri, the poet Jagannātha, and others (R. 1934: 113-116).

The fourth edition, published in 1958, has some new features compared to its predecessors. It consists of eight parts, in which there are three important clarifications. In the chapter entitled "Genesis, Development and Conspectus", Ranganathan clarified that the new formulation of the work was conditioned by the application of the scientific method he had just: "The next stage in the development of the Classified Catalogue Code was conditioned by the advent of scientific method" defined (R. 1958: 14). He also specified that the style he adopted in formulating the rules in the first edition was close to the style of the *sūtra*s[34]: "The Rules in the very first edition made some approximation to the Sutra (aph-

[34] On the use of *sūtra* style in Ranganathan's work, see Gauri 1992: 114.

orism) style of exposition. This style is the one used for basic codes and texts in Sanskrit tradition. This style is extremely sensitive to the principle of 'atomic unit-thought' in the construction of a rule" (R. 1958: 21).

In the chapter entitled "Normative Principles" Ranganathan stressed the importance of the so-called laws of interpretation, originally developed within the schools of Mīmāṃsā and Nyāya (Sarkar 1909). He explained that he had intended to carry out with Kuppuswami Sastri an examination of the entire Classified Catalogue Codex from the standpoint of these laws, but that the death of this eminent scholar had prevented its realisation (R. 1958: 50-51):

> The well-known principles of interpretation, such as the 1,008 principles of interpretation listed in the *Nyaya-kosa*. […] These principles have been evolved to a remarkable extent by the philosophers of the Purva-Mimamsa and the Nyaya Schools of Indian philosophy. In law too, such principles are applied necessarily. A Catalogue Code is like a legal document. Any Rule in it should be interpreted like a legal text. For example, there may be conflict between one Rule and another. In actual application, the conflict should be resolved with the aid of the Laws of Interpretation.

3.4. The Prolegomena to Library Classification

Along with *The Five Laws of Library Science* and the *Colon Classification*, the *Prolegomena to Library Classification* was the third seminal work of this first period. Published by the Madras Library Association in 1937, it was the result of a long period of preparation, during which Ranganathan developed and refined his classification scheme. The third edition published thirty years later remains one of the milestones of the modern classification theory. As Henry Evelyn Bliss (1870-1955) noted in his review (1938: 299-300):

> This book is different, even radical, and it is therefore rather difficult to read and to review; it is unlike all other books on the subject, though it derives much from them; it differs in treatment and in terminology; and in many respects it is original.

The work is divided into two parts: the first part, "Theory", develops a theory of classification in five chapters, presenting twenty-eight canons and other relevant issues; the second part, "Comparative Study", consists of four chapters.

The canons of classification were originally formulated by W.C. Berwick Sayers and later by Henry Evelyn Bliss. Ranganathan had already dealt with this subject in the first edition of *Colon Classification*, but in this work the canons were expanded in the light of the five laws (R. 1957a: 382). One of the most fascinating concepts he formulated, which would later appear in other works, was that of the "Universe of Knowledge". In the fourth chapter, entitled "Theory of Knowledge Classification", he gave this definition of it (R. 1937: 93-94):

> The theory of knowledge classification is concerned with the elucidation and solution of the special problems that arise when the original universe classified is the Universe of Knowledge. Knowledge may be defined as "the sum of information conserved by civilization". We speak of the *boundaries* of knowledge and of *extension* of knowledge by research. The boundaries of knowledge change with time. Thus, at any moment we may speak of future knowledge or inaccessible or potential knowledge.

Since the universe of knowledge consists of "an infinity of entities some of which are unknown or may become known only in future" (R. 1937: 98), Ranganathan introduced three further canons in his classification scheme: 1) Canon of Hospitality in Array; 2) Canon of Hospitality in Chain; 3) Canon of Mnemonics[35]. Of the latter he identified two types, called "Scheduled Mnemonics" and "Non-Scheduled Mnemonics" (R. 1937: 121), the second of which he would later adopt under the new name of "seminal mnemonics". To demonstrate the application of some classification procedures, Ranganathan gave some examples from Indian tradition, such as Nārada's *Bhaktisūtra*, and Indian medicine (R. 1937: 133, 152). In the fifth chapter, devoted to the "Theory of Book Classification", Ranganathan introduced an additional fourth canon, the Canon of Classics, for which he used references to the classical Sanskrit grammatical tradition, in particular Pāṇini's *Aṣṭādhyāyī* and three chains of commentaries dependent on it, and to Vedānta philosophy (R. 1937: 158-160).

In the second part of the volume, devoted to comparative studies, Ranganathan provided a comparative study of five classification schemes, including the Decimal Classification, Cutter's Expansive Classification, Library of Congress Classification, Brown's Subject Classification and Colon Classification, as well as a very interesting and extensive one of mathematics (R. 1937: 184-210, 211-235).

This masterpiece was followed the next year by *Theory of Library Catalogue*, a work on the practice of cataloguing dedicated to his mother Sitalakshmi. As an epigraph, he reproduced a saying of Confucius on the unity of knowledge, quoted by the American poet Ezra Pound (1885-1972) in his essay *Guide to the Kulchur*, recently published in London, which seems particularly revealing (R. 1938: 12):

> Said the philosopher: You think that I have learned a
> Great deal and keep the whole of it in my memory?

[35] "An Analytico-Synthetic Classification has no rigid, pre-determined facets. It only prescribes the sequence of isolates and facets according to Postulates, Principles and Canons. A Faceted Classification is not analytico-sinthetic unless it is freely faceted and is guided by Postulates, Principles and Canons" (Kaula 1980: 118).

> Sse replied with respect: Of course. Isn't that so?
> It is not so. I have reduced it all to one principle.

Unlike the *Five Laws of Library Science*, which traced the library practice back to five basic principles, and *Prolegomena to Library classification*, which identified the foundations of library classification, *Theory of Library Catalogue* was intended to be an examination of the theoretical foundations of the practice of cataloguing, the applications of which included the invention of the chain procedure (R. 1957a: 381). Divided into six parts, the work contains only two references to the ancient Indian tradition that are worth mentioning here. One concerns the self-educational value of teaching, already emphasised by the ancient seers of the *Upaniṣad*s, consisting of four stages: *adhīti* (study), *bodha* (understanding), *ācaraṇa* (practice) and *pracāraṇa* (teaching) (R. 1938: 14). The other relates to the untranslatability of some terms of the Sanskrit language. Ranganathan reported some cases from the British Museum Catalogue that represented both terms: Philosophy of Grammar. Sphota – Prosody. Chhandas (Sanskrit). Yappu (Tamil) – Rhetoric. Alamkara (Sanskrit and Tamil) (R. 1938: 126). Regarding the use of the "name entries", Ranganathan reiterated a suggestion made by Kuppuswami Sastri in *Classified Catalogue Code*: "One golden rule, however, which a librarian, who is concerned with the classification and cataloguing of any considerable collection of Sanskrit books, can easily remember and follow is – '*Refuse to be guided by mere names*'" (R. 1938: 296).

3.5. The First Formulation of Reference Service

This same suggestion was taken up two years later in *Reference Service and Bibliography*, a work that concluded ten years of Ranganathan's scholarly output (R. & Sundaram 1940: 427). Published in two volumes and dedicated to Kuppuswami Sastri, with a foreword by Sir Maurice Linford Gwyer (1878-1952), the work features in the first volume (parts I-IV), published in 1940, in-depth discussions of reference service in general, ready reference service, long range reference services and bibliography, while the second volume, printed in 1941, is devoted entirely to a bibliography of reference books and bibliographies (part V) (R. & Sivaraman 1941: 13):

> Parts 1-3 given in the first volume expounded the what, the why and the how of reference service, *i.e.* of establishing contact between the right reader and the right book in a personal way. It was established that it was reference service that was the effective operative part of the work of a library, that, in fact, every other work in a library should culminate in it and that it marked the one occasion that witnessed the coming together, in an intimate, integrated and creative manner, of the three elements constituting the trinity in a library *viz*. the readers, the staff, and the books.

The main aim of the work was the quality of the reference service, as Ranganathan later wrote (R. 1957a: 383-384):

> Reference service is the primary motive and the culmination of all library practices. Its varieties, the what, why, and how of them, the preparation for them, the varieties of bibliographical and reference materials needed for their efficient performance, and the organisation of the time of the staff in relation to them – all these are drawn out of the five laws in the *Reference service and bibliography* (1940).

When Ranganathan published the second edition twenty years later, he decided to replace the original version with three different books, *Reference service*, *Documentation and its facets*, and *Enumerative bibliography* (R. 1961: 43-44; 1963: 20)[36].

In the first edition we find several chapters that deal with topics directly related to Indian culture. In the chapter entitled "Reference Service" the multiplicity of knowledge contained in the books was compared by Ranganathan, with a suggestive image, to the variety of Śrī Kṛṣṇa's garments (R. & Sundaram 1940: 91):

> The books sometimes put on various kinds of dress and some like Sri Krishna bewilder their lovers by surrounding them simultaneously in different dresses – as catechism, case studies, source-books – in the form of verse, drama, fiction, essays, and so on.

When engaged in his service, the reference librarian "may very well be imagined to hum Janaka's words" (R. & Sundaram 1940: 100):

> Here is my daughter Sita (= picked up from the earth through its furrows).
> She will help you in your life's pursuits.
> Accept her. You will be happy.
> Clasp her hand by your hand[37].

He should act as an instrument of Śakti and acquire the qualities of wisdom, strength, harmony and perfection corresponding to the four aspects of Śakti as described in Śrī Aurobindo's *The Mother* (R. & Sundaram 1940: 131-135).

References to Indological topics are numerous in this work. In section 13252 "Eastern Classics in Western Garb", Ranganathan emphasised the role of the librarian in finding classics of Hindu, Buddhist, Jain, and Islamic origin (R. & Sundaram 1940: 102-104). In section 13253 "Hide and Seek in Ancient Sanskrit"

[36] As far as we know, the third book was never published.
[37] *Rāmāyaṇa* 1.73.26-27.

he recalled the importance of anthologies, in which the reader could consult fragments of works now lost, and of the ancient *Purāṇa*s (R. & Sundaram 1940: 104-105). In section 1333 "The Trinity in Library" he referred to Śakti and the categories of the Sāṃkhya to highlight the role played by library staff, readers and books (R. & Sundaram 1940: 129-130):

> It must be constantly borne in mind that the library is a trinity made up of books, readers and staff – particularly the reference staff. We have a library only when all the three factors stand integrated. The reference staff should realise that they are the power that mediates between the reader and book and stimulates integration. Indeed their part is not unlike that of *Sakti* in the Trinity, *Purusha* (= the divine unmanifest), *Prakriti* (= nature which stands in need of enrichment by *Purusha*), and *Sakti* (= the energy principle that corresponds to the descending of *Purusha* on *Prakriti* and the ascending of the latter to the former).

To each of these principles he referred a quality of the trinity (R. & Sundaram 1940: 131):

> The books constitute *Purusha* as *Akshara Brahma* (= scriptal form of God). The readers constitute *Prakriti* manifesting itself as *Manushya Prakriti* (= human manifestation of nature). The *Purusha* seeks fulfilment in enlivened *Prakriti* and the consummation of the *Prakriti* consists in realising *Purusha*. The descent of *Sakti* on *Prakriti* transmutes it and the sublimated *Prakriti* reaches out to the *Purusha*[38].

In section 22101 "Ancient Reference Books" we find references on Sanskrit reference books, such as the *Nirukta* (ancient science of word meaning), the *Amarakośa* (a classical Sanskrit dictionary), the *Anukramaṇikā*s (indexes to Vedic hymns), the *Purāṇa*s (chronicles of ancient India), and Varāhamihira's *Bṛhatsaṃhitā* (a kind of encyclopedia) (R. & Sundaram 1940: 149).

The correct attitude of the reference librarian should be the one so delicately described in Sītā's words to Rāma: "I do not instruct; I only remind you out of my love and regard for you" (R. & Sundaram 1940: 234)[39]. Moreover, the mind of the reference librarian should possess the inner qualifications of the Yoga practitioner, according to the teaching of Kṛṣṇa: "When he sees, hears, tastes, smells, eats, moves, sleeps, breathes, speaks, takes, ejects, opens his eyes or closes them, he holds that it is only the senses acting upon the objects of the senses" (R. & Sundaram 1940: 293)[40].

[38] See below, 54.

[39] *Rāmāyaṇa* 3.9.24.

[40] *Bhagavadgītā* 5.8-9. Translation taken from *The Message of the Gita: As interpreted by Sri Aurobindo* (1938).

The fourth part, entitled "Bibliography", also contains several references of Indological interest. In the Section 43131 "Catalogus Catalogorum of Sanskrit Works" Ranganthan recalled the seminal contribution by Kuppuswami Sastri to the revision of Aufrecht's *Catalogus Catalogorum* (R. & Sundaram 1940: 430):

> Many hundreds of old manuscripts are also being newly brought to light. Hence the University of Madras has taken on hand a revision of the *Catalogus catalogorum*. The intention is to indicate also all the printed editions of the classics. Hence though the original edition was predominantly a bibliography of manuscripts the contemplated new edition will be equally rich as a retrospective bibliography of the Sanskrit classics printed so far[41].

In Section 4322 "Second Hand Catalogues" we find some good examples of these types of catalogs, such as the *Catalogue de fonds de la librarie orientale*, the *Ratnasamuccaya or a Comprehensive and Classified Catalogue of Sanskrit Works published in India and abroad* of the Sanskrit Book Depot (Lahore), the issues of the *Catalogue of Sanskrit, Pali, and Prakrit Books* of the Oriental Book Agency (Poona) (R. & Sundaram 1940: 454-455). On the other hand, in section 452, "Early Sanskrit Authors", Ranganathan provided some examples of auto-bibliographical content in authors such as Vācaspati Miśra[42], Śrīharṣa[43], and also in later authors such as King Kumbhakarṇa of Mewār[44], Divākara[45], Nārāyaṇa Paṇḍita[46] and Rāmānandatīrtha[47] (R. & Sundaram 1940: 485-486). These are followed by hymnic bibliographies ascribed to Veṅkaṭamakhi[48], Rājacūḍāmaṇi Dīkṣita[49], and Veṅkaṭavarada[50] (R. & Sundaram 1940: 486-487). An interesting example is given by the hymn *Granthamālikāstotra*, in which 37 works ascribed

[41] Preparatory work began in 1935 (Kirfel & Kuppuswami Sastri 1935: 430). A provisional issue of the *New Catalogus Catalogorum* was published in 1937, to be circulated among scholars for suggestions. In the preface, Kuppuswami Sastri, as editor-in-chief, suggested that Jain or Buddhist literature, whether in Sanskrit or Prakrit, should also be included to give a more complete picture of the cultural developments of ancient India (Kuppuswami Sastri 1937: vi).

[42] A famous commentator on all six schools of Indian philosophy, active from the 9th century, who listed his major works in the pre-colophon verses of his *Bhāmatī*, a commentary on Śaṅkara's *Brahmasūtrabhāṣya*.

[43] A 12th-century poet, author of the *Naiṣadhīyacarita*.

[44] In *Rasikapriyā* commentary on Jayadeva's *Gītagovinda*.

[45] In *Bhāratāmṛta kāvya*.

[46] In his commentary to Kālidāsa's *Kumārasaṃbhava*.

[47] In his *Yathārthamañjarī*.

[48] A celebrated 17th century author.

[49] In his poetic work entitled *Kāvyadarpaṇa*.

[50] In the prologue to his work *Kṛṣṇavijayaḍima*.

to Madhvācārya, the 13th century founder of the dualistic (*dvaita*) Vedānta school of philosophy, are listed in verse. The hymn ends with a statement of faith: "By the mere recital of these Hari, the Lord of Madhva, is pleased" (R. & Sundaram 1940: 486)[51].

In the third chapter, entitled "Long Range Reference Service", there are references to Śaṅkara, founder of the non-dualistic (*advaita*) school of Vedānta (R. & Sundaram 1940: 261), and a discussion of the work of the polymath Appaya Dīkṣita (R. & Sundaram 1940: 264-265). Here, Ranganathan once again makes use of the *Rāmāyaṇa* to emphasise the significance of the reference service. The ideal of long range-reference is exemplified in the words of the arch-priest of service Hanumān (R. & Sundaram 1940: 321):

> Hope is the root of all service. Search again, I will, where I have not yet searched. Hope is the greatest happiness. It is hope that always directs us in all our endeavours. It is that which brings all the efforts of beings to fruition. Therefore I shall continue my hopeful attempts[52].

The final enthusiasm is expressed in the unison words of Sītā and Bharata (R. & Sundaram 1940: 323):

> Happy seems to me the popular saying. "If only one would keep on to life, delight is assured even though it may take a hundred years in coming"[53].

The feeling of joy and satisfaction is described by recalling the words addressed by the King Daśaratha to the sage Viśvāmitra (R. & Sundaram 1940: 340):

> Welcome to thee, the great revered one. I consider your coming as the obtaining of nectar. It is as welcome as the coming of rain during draught, as the getting of a son by the wedded wife of one who had long been childless, and as the recovery of the fortune that was lost. I find in this as much joy as in a great festivity[54].

3.6. From Madras to Delhi

The last years at the Madras University Library were not particularly easy for Ranganathan, due to the unfavorable climate in which he was working (R. 1992, ix):

[51] Vyāsarājatīrtha, *Granthamālikāstotra* 15.
[52] *Rāmāyaṇa* 5.12.10-12.
[53] *Rāmāyaṇa* 5.34.6.
[54] *Rāmāyaṇa* 1.18.50-52.

> Ranged against him were no ordinary mortals: The famous Lakshmanswami Mundaliar, Vice-Chancellor of Madras University for an unparalleled span for more than 25 years, renowned for his administrative efficiency; Dr. M.O. Thomas who joined as Assistant Librarian at Madras University, after his famous tenure as Librarian at the Andhra University, who started the Library Science course in 1935 at Waltair; the helpless veneer of Khan Bahadur Asadullah, the Librarian of the Imperial Library at Calcutta and the Secretary of the Indian Library Association, etc. They were not alone but with a tumultuous group of supporters, planning the next move to engulf Dr SRR, by pruning the previous lapses. The adversity succeeded in turning him out of Madras University Library, earlier than his retirement in 1944.

During this period, however, he published two important works: *Library Classification: Fundamentals & Procedure* (1944), where he developed the postulate of fundamental categories and the facet analysis, and *Elements of Library Classification* (1945), based on lectures delivered at the University of Bombay in December 1944 (Devadason 1986: 132):

> His first account of the five Fundamental Categories that underlie the division of any subject or discipline was incorporated in the 4th edition of his Colon Classification. His system of facet analysis based on the Fundamental Categories paved the way for the development of faceted classification schemes and new index languages in Britain and Europe in the 1950s and 1960s.

In 1945 Ranganathan decided to give up his job as a librarian with the intention to devote himself to active research. Sarvepalli Radhakrishnan (1888-1975), then Vice-Chancellor of Banaras Hindu University in Varanasi, invited him to improve and modernise the university's library services. Ranganathan's original intention was to move to Delhi, but the arguments of Sarvepalli Radhakrishnan, who personally went to meet him at his residence in Madras, were persuasive and he finally accepted the invitation (Ghatak 1962). Although Ranganathan had high expectations of this new assignment, his daily activities and the attitudes of his staff in Varanasi were not much different from those in Madras, as his son reminds us (Yogeshwar 2001: 232-233):

> As far as his job was concerned, he had fallen from the frying pan into the fire. He had come to start a School of Library Science. Instead, he ended up doing routine jobs to get the Library working. The main problem had been the staff. A livening up of the Library would have called for more efforts on their part. They were opposed to adopting Father's techniques. They had preferred the existent primitive systems imported long ago and were out to sabotage anything Indian or which called for effort.

In 1947, he then moved to New Delhi thanks to the good offices of Sir Maurice Linford Gwyer, Vice-Chancellor of the University of Delhi, who had visited

Madras between 1939 and 1941 and invited him "to work out a five-year plan for 'his' University" (Yogeshwar 2001: 238). On 17 June, Ranganathan settled in Delhi with his entire family and was appointed honorary professor of librarianship, a few weeks before India became independent (Yogeshwar 2001: 241)[55]:

> He had nothing to do with the running of the University Library. He had an office in the building, which also doubled as a lecture room, and could use the Library as the laboratory to back up his teaching work. He had no administrative duties.

4. Second Period (1948-1967)

His arrival in Delhi marked a significant change in Ranganathan's scientific life. Released from practical duties, he could now devote himself entirely to teaching and research. Between 1947 and 1950, under his direction, the Department of Library and Information Science established a Master and a PhD in Library Science[56].

From 7 June to 5 October 1948 Ranganathan travelled to Europe and America for scientific and research purposes. His account of the tour, published in 1950 in the "English Series" of the Indian Library Association, in Delhi, under the title *Library Tour 1948: Europe and America. Impressions and Reflections*, was dedicated to Sir Maurice Gwyer[57]. As an annex to the text, Ranganathan reported the itinerary of the tour and a diary of institutional meetings with dates and times. Among these he mentioned a very promising meeting with a representative of the Rockefeller Foundation (R. 1950b: 139).

> I had met the representative of the Rockefeller Foundation in the Commonwealth Universities Congress at Oxford. I met him again in New York and asked if the Foun-

[55] On 18 July 1947, India and Pakistan became independent with the passage of the Indian Independence Act by the Parliament of the United Kingdom. The Act came into force on 15 August 1947 immediately after its passage.

[56] At the request of F. Donker Duyvis, the then Secretary General of the International Federation for Documentation, Ranganathan wrote the booklet *Classification and international documentation* (FID Pub. 227) in November 1947. From 1949 to 1953, he was editor of the journal "ABGILA: Annals, Bulletin, Granthalaya of the Indian Library Association", which changed its title to "Journal of Indian Library Association" from 1955 to 1964. In 1954 he was the founder editor of the "Annals of Library Science" launched by the Indian National Scientific Documentation Centre (INSDOC) (Satija 1992: 4-5). For Ranganathan's contributions to the "Annals of Library Science" see Rajalakshmi & Pal 1992.

[57] Among the cities visited during the tour Ranganathan mentions: Paris, Copenhagen, Stockholm, Oslo, London, Reading, Oxford, Edinburgh, Leeds, New York, Washington, Littlehampton, Brighton, Eastbourne or Branby (R. 1950b: 11).

> dation could in any way aid the pursuit of Library Science in India. He has taken action on it. Something tangible may come out of this.

According to the 1950 *Annual Report* of the Rockefeller Foundation, he was awarded a grant of $ 5,500. The purpose of the invitation was to explore the role of classification: "Dr. S. R. Ranganathan, Delhi, India; to visit the United States and various centers in Europe and continue his work on the classification of knowledge" (Rockefeller Foundation 1950: 268)[58].

4.1. A Turning Point Year

The year 1951 was a real turning point, marked by the publication of two important works: *Philosophy of Library Classification* and *Classification and Communication*[59]. *Philosophy of Library Classification*, published in 1951, consists of a conspectus and eight chapters, three of which are directly relevant to the subject we are discussing. The first chapter "Evolution of Classification" is devoted to a definition of the function of classification and its evolution over time, from the earliest Vedic testimonies (R. 1951c: 16):

> Humanity too, like individuals, had started classifying even in its very early infancy. *Vedic* literature, which is perhaps the oldest known specimen of the literary remains of the intellectual output of humanity, bristles everywhere with the effects of this human tendency to classify. Apart from evidence of systematic thinking and classified arrangement of thought, *Vedic* literature has sections devoted to the very process of classification – analysis, grouping and arrangement.

The second chapter "Library Classification: An Artificial Language" explores one of the peculiarities introduced by Ranganathan into the classification process, the facet analysis and the five fundamental categories, already defined as

[58] In 1949, a representative of the Rockefeller Foundation had met Ranganathan in India and invited him to the United States. Here Ranganathan visited several factories with his student S. Parthasarathy "in order to get ideas on design of depth classification for use in documentation work and service" (Kaula 1962: 81). In Europe, he spent a few weeks at Unesco to study the relationship between classification and document retrieval machines. The result of this stay was the article *Classification, Coding and Machinery for Search* (R. 1950a).

[59] A third work, *Readings from the Ramayana*, a tribute to Vālmīki's epic poem, was released in the same year (1951d). Some verses from the fifth book *Sundarakāṇḍa* and the sixth book *Yuddhakāṇḍa* were read in the original Sanskrit by Ranganathan, while the extracts from the *Bhagavadgītā* in Sanskrit and in English translation were read by Telliyavaram Mahadevan Ponnambalam Mahadevan, professor at the University of Madras, scholar of Advaita Vedānta and devotee of Ramaṇa Maharṣi, and by Swami Nikhilānanda, founder of the Ramakrishna-Vivekananda Center in New York in 1933.

we have seen in the 1940s, but now placed in a more theoretical context (R. 1951c: 56):

> We come last to a fundamental point bearing on Facet-Analysis. An examination of the facets of different subjects shows that they can all be related to one or other of five fundamental categories: Time, Space, Energy, Matter and Personality.

Among these categories, Personality differs from the others because it is unanalysable, it is "what is left of a subject after Matter, Energy, Space and Time have been identified"[60] (R. 1951c: 58):

> The fifth fundamental category Personality, which has to be used in a very generalised sense as stated above, is unanalysable. We have to treat it gently and as a whole. It is the most concrete category.

Another important issue is that of "unscheduled mnemonics", which, as Ranganathan recalled, some scholars found too mystical to define. He introduced the distinction between classificatory and natural language, quoting Goethe's statement that "a divine language alone can express the deeper experiences of a poet and that an expression in a natural language misses the depth, the aroma and the infinitude of experience" (R. 1951c: 69). Even the Bengali saint Rāmakṛṣṇa claimed that he was unable to express the state of *samādhi* he had attained (R. 1951c: 69):

> He remarked that, as he reached towards that state, the differentiated manifestations of the phenomenal world gradually shed their differences, and reduced themselves to fewer and fewer patterns, that when the number of patterns fell below a certain number they were so unfamiliar to the ordinary folk that the natural language, which alone was intelligible to them, had not thrown forth any term to denote them and that ultimately, when the pattern was about to be reduced to a single one, his own identity also was lost in the one; with the result, when he recovered from that depth, he could say nothing, in words intelligible to us, of experiences below a certain depth. The *Vedas* declare this in the well-known passage:
> "Unable to reach which, the words return along with Manas"[61].

Here we find for the first time a detailed account of the cognitive process and a description of the *samādhi* state, which Ranganathan takes from the ancient Indian tradition (R. 1951c: 69):

[60] This definition was formulated by Ranganathan during a seminar at Rutgers University in the state of New Jersey in 1964 (Foskett 1986: 144).
[61] *Taittirīya Upaniṣad* 2.9.1.

> *Manas* is that part of the mind which acts as a channel between *Chitta* (= memory) which is the store of impressions and experiences on the one side and *Buddhi* (= intellect) which develops the impressions and experiences by permutations and combinations and creates new impressions and experiences of its own. Production of articulate sounds, words and intelligible language, and other symbols, is one of them. As a transmission wire breaks down when the voltage increases beyond a certain measure, the *Manas*, which is like transmission wire between *Chitta* and *Buddhi*, is overpowered when the intensity of what is poured into *Chitta* increases beyond measure during deep experiences and *samadhi*.

In the third chapter "Library Classification and Social Forces" Ranganathan pointed out the limitations of an enumerative classification system applied to the "universe of current knowledge" (R. 1951c: 87):

> An enumerative scheme with a superficial foundation can be suitable and even economical for a closed system of knowledge. For example, such a scheme will work well for Ancient Greek or Indian Philosophy both of which had become crystallised and fixed in far-off days. They may even present a continuous spectrum of specific subjects. Even then they can be tied by an enumerative system as with a thong. It is not the mere infinite nature of the universe of knowledge which baffles an enumerative system so long as it is only a statical continuum. What distinguishes the universe of current knowledge is that it is a dynamical continuum. It is ever-growing; new branches may stem from any of its infinity of points at any time; they are unknowable at present. They can not therefore be enumerated here and now; they can not be anticipated; their filiation can be determined only after they appear.

The second seminal work, *Classification and Communication*, was the result of his stay in the United States at the invitation of the Rockefeller Foundation (R. 1967b: 26):

> Before I left USA about the end of September 1950, Chester I. Barnard, the then President of the Rockefeller Foundation, disclosed to me that one of the reasons for inviting me to the Foundation was to give me facilities to lay a foundation of library classification as a language of ordinal numbers, so as to make it serve, if possible, as an international language of communication free from the fussiness usually caused in a natural language by drifting folk – modifications, emotional undertones, and association of ideas.

The work is divided into three parts, with a total of 24 chapters. In the first part, "Classification and Its Evolution", Ranganathan traced the development of the meaning of classification from its simplest sense, that of dichotomy, to increasingly advanced meanings, and presented the structure of his Colon Classification scheme, from its origin in 1933 to this latest work. This first part is

completed by reflections on the superiority of what he calls "depth-classification"[62], where we find a reference to the figure of Śūrpaṇakhā in the *Rāmāyaṇa*[63]. The episode concerns the dialogue between Rāma and Śūrpaṇakhā, who, having been rejected by him, took revenge on Sītā (R. 1951a: 117-118):

> Rama had a cheerful face; the demon-woman had an evil look.
> His waist was slim; she was pot-bellied.
> Rama was broad-eyed; she was squint-eyed.
> His hair was fine; hers was copper-coloured.
> Rama was handsome; she was shapeless.
> He had a pleasant voice; hers was harsh.
> Rama was a youth; she was a hag.
> He was considerate in his talk; she was foul.
> Rama was righteous; she was very wicked.
> He was endearing; she was repulsive.
> […]
> This woman of yours is deformed and ugly. She is no worthy partner to you. I shall devour this ugly, wicked frightful woman slim at waist along with that brother of yours[64].

In the second part, "Communication", Ranganathan analysed the different aspects of communication in order to understand what role classification can play in this area. A first insight relates to cooperative life that pervades every level, vital, mental and spiritual. Vedic literature and ancient poetry like the *Rāmāyaṇa* trace this cooperation to mystical and spiritual experience. Material happiness, mental joy and spiritual bliss are best achieved in co-operation with others rather than in isolation, as a famous Vedic hymn states (R. 1951a: 125):

> Move together, talk together, understand aright.
> Deliberate together, achieve together,
> Remember in common, think in co-operation.
> Alike be your intentions, harmonious your feeling,
> And concerted your thoughts,
> So that there may be complete co-operation among you[65].

[62] "It may be called depth-classification because it carries the exploration of the intension of the specific subject to the deepest level possible and, for this purpose, has to employ analysis of the greatest penetration and depth" (R. 1951a: 113).

[63] Śūrpaṇakhā was a *rākṣasī*, sister of the king of Laṅkā, Rāvaṇa, and daughter of the sage Viśrava and Kaikasī.

[64] *Rāmāyaṇa* 3.16.9-12, 25-26.

[65] *Ṛgveda* 10.191.2-4.

This concept was later reiterated by him with the hope that cooperative life on a world scale could be realised in the future through the attainment of the special state that Aurobindo called "supra-mental" (R. 1951a: 139):

> When it matures, eludes ethnic grips, develops control over emotions, becomes dominantly intellectual, and enters the supra-mental stage described by Sri Aurobindo, it will get glimpses of the delight of co-operative living in un-truncated, infinite context – the delight (=*Ananda*) which stray individuals have realised hitherto and denoted by the profound term Pure Existence *cum* Pure Consciousness *cum* Pure Delight, *Satchidananda*.

A second insight concerns what Kuppuswami Sastri called the "School of Overtones", according to which "literature leans more upon suppression than upon expression" (R. 1951a: 174). In this connection he reported his experience of reading the *Rāmāyaṇa* (R. 1951a: 175-176):

> The experience with our premier poem Valmiki's *Ramayana* is just this in the case of most readers. During the last 35 years I have gone through 30 cycles of re-reading it. Surely my stock of experience and my apperceptive mass had been necessarily enlarged during this long stretch of years. They have been added to gradually year after year. The result has been that in each cycle of reading, the same old words of Valmiki communicated to me progressively varying streams of thought.

For Ranganathan, there was a fundamental difference between the language of literary exchange and the classificatory language, the latter being inadequate for communicating the transcendental experience of an artist (R. 1951a: 176):

> By definition a classificatory language should have one-to-one correspondence with the thought represented by it. It should admit of no stratification in meaning. It must yield its meaning in its entirety in one instalment. It is therefore totally unsuited to serve in the communication of the transcendental experience of a literary artist.

To Ranganathan, literary exchange lies therefore beyond the limits of classificatory language. He derived this conviction from his long experience in defining classificatory language (R. 1951a: 178):

> Though I have devoted a large part of this life-time of mine to building up and improvement of classificatory language, I am second to none in declaring that literary exchange is a forbidden realm which classification should never enter.

Besides poetic language, Ranganathan saw a deeper level of communication, the mystical experience, of which poetic communication is only a weak approximation: "Mystical experience is in fact 'unspeakable'" (R. 1951a: 179). To this

he brought the testimony of a Bengali saint, who lived in the nineteenth century (R. 1951a: 179-180):

> The mystic referred to is Sri Ramakrishna, in whose name a mission has been established for promotion of spiritual awareness and social service not only in India but in several other countries. One of his disciples has recorded the following anecdote. The sage looked unusually sad one day. One nearest to him asked him why it was so. He said that he felt sad because he was not able to communicate to humanity the most precious and pre-potent part of his experience. It related to *Samadhi* which means getting into the state of Identity with the Absolute. He wished to communicate to his immediate disciples and to humanity at large the delight of *Samadhi*. He wished to remember his progression into that state of delight as he entered *Samadhi*. But it often happened that up to a point he could be conscious of the various factors and of the varying qualities of the delight but when it reached beyond a certain degree of intensity he was enveloped with the sense of Identity so completely that there was nothing to see or sense. There was nothing structural. There was no pattern which is the very essence of what calls for expression. Similarly when he receded from *Samadhi* until he got out of the threshold of supreme delight, the Identity continued to negative the structure and the pattern needed for expression.

Those who attain these high degrees of enlightenment – Ranganathan continued – have a direct experience of the thing-in-itself, their experience is not mediated by the senses or the intellect. This faculty may be called intuition, in Sanskrit *divya-cakṣus*, literally "divine eye" (R. 1951a: 180):

> The term used in Sanskrit tradition to denote this faculty *is Divya chakshus* which may be verbally translated as divine insight. The climax in the *Bhagavad gita* is Krishna endowing Arjuna with that faculty to see globally all things-in-themselves. The *Ramayana* also refers to this all comprehensive unmediated intuition and experience and uses the word *Tapas* to denote the means by which intuition is developed.

Ranganathan then relates mystical experience to the two types of realism already mentioned, distinguishing between knowledge dependent on action (*kartṛtantra*) and knowledge dependent on the thing-in-itself (*vastutantra*) (R. 1951a: 180-181)[66]:

> *Kartr Tantra* realism tends to view the universe as made of distinct, separate or separable entities, things or concepts. Arguments and communication have to rest on sharp alternatives. Their roots are in the soil of atomism. In *Vastu Tantra* realism there are no sharp antithesis and distinction. It has its roots in the view which regards all

[66] The reference was already given in the second edition of *Colon Classification* (1939: 1.126).

> *Kartr Tantra* reality as the creature of truncated context and is therefore in the true sense incomplete. According to it, it is only the whole universe which can be the real subject of significant communication. It tends to avoid superficial clarity and simplicity. It calls attention to the unspeakable complexity of experience. It systematically undervalues the importance of abstraction.

In part three, "Classification and Its Future", Ranganathan identified new areas of research in the field of classification[67]. It contains two interesting references to the Vedic tradition. In the section entitled "A Suggestion", he applied the ancient categories to the book. Just as each individual is the result of a tripartite division, soul, subtle or astral body, and material body, so texts are characterised by three levels: subject and class; language and form of exposition; nature, form, and size (R. 1951a: 253)[68]:

> According to this tradition, every individual has
> (1) *Atman* (Soul);
> (2) *Sukshma Sarira* (Subtle or intangible, or astral body); and
> (3) *Sthula Sarira* (Gross, or tangible or sensually perceptible body).
> Applying this tradition to reading and kindred materials, we get the following equivalents:
> Soul = Thought-content = Specific subject = Class Number
> Subtle body = Medium of expression embodying the thought = Language and form of exposition = Book number
> Gross body = Physique embodying the expressed thought = Nature, size, shape, etc., of the reading and kindred materials viewed as physical commodities = Sequence Number

In the section "Potency of Energy-Facets", he reproposed Aurobindo's trinity concept of *puruṣa*, *prakṛti* and *śakti* and related the "energy facets" to the "seminal letters" of the ancient tradition (R. 1951a: 257-258):

> It is only when energy-facets develop that personality gets differentiated and becomes comprehensible. Such is the potency of energy-facets. This is all in keeping with Vedic and other mystic traditions. Shri Aurobindo has described it in several of his writings. The Trinity consists of *Purusha* (=the divine personality unmanifest), *Prakriti* (=the inert matter in need of enrichment by *Purusha*) and *Sakti* (=the energy-principle needed to effect the enrichment). The phenomenal world owes its existence to the functioning of the energy-principle. Intellectual pursuits are largely concerned with the phenomenal world. Helpful organisation of the result of intellec-

[67] This third part includes a description of the model Apupa, further developed in the third edition of the *Prolegomena to Library Classification* (1967b: 383-384, 544-546).

[68] It is the doctrine known as *śarīra traya* of the "three bodies", according to which the human being is composed of three bodies (*śarīra*): gross (*sthūla*), subtle (*sūkṣma*) and causal (*kāraṇa*).

> tual pursuits and particularly their records should naturally depend on the efficiency with which the energy-facets and the foci in them are isolated and arranged in a helpful order. The *Bija Aksharas* (=Seminal letters) of the Indian tradition may throw light on this problem if we could get at their esoteric significance. I have been seeking it. But I have not yet met with success[69].

4.2. The Spiral of the Scientific Method

In 1952, Ranganathan published the fourth edition of the *Colon Classification*, four parts in one volume, in which he introduced many new concepts, including the "five fundamental categories", which helped to alleviate the rigidity of the facet formula of earlier versions. Between 1954 and 1957, he moved to Zürich for private reasons. During his stay he wrote the second edition of the *Prolegomena to Library Classification*, published by the Library Association in London[70]. From 11 to 18 September 1955 he attended an International Conference of Libraries and Documentation Centres in Brussels, during which an important resolution on facet analysis was adopted at the plenary meeting on 16 September (R. 1967b: 29):

> The FID recommends that a deeper and more extensive study should be made of the general theory of classification, including facet analysis, and also of their application in the documentation of specific subjects.

From 13 to 17 May 1957, he took part at Beatrice Webb House, Dorking, in an International Study Conference on Classification for Information Retrieval, organised by the ASLIB (Association of Special Libraries and Information Bureau), in collaboration with the British Classification Research Group and the School of Librarianship of the University of London. In a letter dated 20 December 1956, the organising committee wrote to the Indian National Centre for Scientific Documentation, INSDOC (R. 1967b: 29):

> This Conference will be a development of all Dr Ranganathan's work in the last twenty years and it will no doubt be a means of spreading interest in his work and appreciation of it.

In 1958 he was invited to attend the International Conference on Scientific Information, held in Washington from 16 to 21 November 1958, which dealt with automatic retrieval and natural language processing in the context of information

[69] The reference is to the sacred syllables, sound symbols of divinity, used particularly in Tantrism as *mantra*s in ritual practice and meditation (Padoux 2011: 2-3).

[70] In Zürich, he was consulted by Douglas John Foskett and Derek Wilton Langridge to prepare schedules for special classifications (Satija 1992: 5).

retrieval. In his talk Ranganathan suggested that "to help in the establishment of a fairly long-lived helpful scheme for classification, a team of epistemologists, psychologists, linguists, reference librarians, classificationists, and statisticians should investigate the way in which the human intellect works today – that is, the Syntax of Facets that will give the greatest satisfaction to the greatest number of readers" (R. 1967b: 579).

Ranganathan also attended the International Conference for Standards on "Common Language for Machine Searching and Translation", held in Cleveland, Ohio, from 6 to 12 September 1959 (R. 1967b: 30), where he "indicated that the analytico-synthetic methodology and faceted classification model based on postulates and principles, which have formed the basis of his Colon Classification scheme, could give more helpful results in machine-based information storage and retrieval" (Neelameghan 1997: iii).

At the same time he published two important works: the article *Library Science and Scientific Method* and the second edition of *The Five Laws of Library Science*. Published in 1957 in the journal "Annals of Library Science", *Library Science and Scientific Method* summarised his epistemological theory in just over ten pages. Ranganathan first identified a terminology useful for describing the scientific method. His terms included: "Know, Knower, Knowee, Knowledge; Senses, Sensation or Perception, Observation, Experimentation; Intellect, Association, Reasoning, Logic, Inductive Logic, Deductive Logic; Memory, Remembering, Recalling; Emotion, Feeling; Intuition or trans-intellectual, trans-sensory, trans-emotional, and trans-memory mode of directly knowing anything-in-itself" (R. 1957b: 20). He went on to describe the process of knowing, characterised by the presence of three elements (R. 1957b: 20-21):

> When knower and knowee are brought into relation, the knower knows the knowee; and knowledge emerges. Knowledge is expressed in language; and expressed knowledge is stored in memory to make recall and communication possible. The simplest mode of knowing is for the knower to perceive the knowee with the aid of one or other of the primary senses. This action may be called primary perception. Little is known about primary perception; perhaps it is ordinarily experienced only by the newborn baby. Soon after birth, association of the results of two or more simultaneous primary perceptions would take place[71]. Each new perception will also be instan-

[71] It is probably a reference to the distinction between indeterminate (*nirvikalpaka*) and determinate (*savikalpaka*) perception found in various Indian philosophical systems. Kuppuswami Sastri wrote: "The Mīmāṁsaka view of *nirvikalpaka* is that it is an indeterminate perception which consists in the direct and simple awareness of an individual object (*vyakti*) and its generic attribute (*jāti*) which arises immediately after the sense-organ comes into relation with them; and that it misses the definite feature of the *jāti* as being common to several individuals belonging to a particular class and the specific character of the *vyakti* as being

> taneously, spontaneously, and inexorably associated with what is already stored in memory. In due course, the mode of knowing goes beyond perception and association; it includes reasoning; and reasoning progressively gets more involved. Increasingly sharper and more powerful logic is used in the reasoning. In course of time, two classes of knowee come to be recognized – one outside the memory of the knower, and the other inside it. An external knowee may be called a Concrete Knowee or an Object. An internal knowee may be called an Abstract Knowee or a Concept. The former adds to concrete knowledge; and the latter to abstract knowledge. Further, a concept, with an object as an external correlate may be called a Concrete Concept; and one without it an Abstract Concept. Concrete and Abstract are only relative terms; they have a meaning only when used together either explicitly or implicitly. We can think of a Scale of Abstraction or of the reverse of it, viz a Scale of Concreteness[72].

He then gave a definition of the "Universe of Knowledge" (R. 1957b: 21):

> Universe of Knowledge is the sum-total, at the moment, of such cumulated knowledge. It is being continuously developed and added to. Different domains of the universe of knowledge are developed by different methods. Scientific method is one of the recognised methods of development.

The scientific method proposed by Ranganathan is characterised by an endless clockwise spiral movement[73]. In the diagram used to illustrate the different phases of the cycle, he indicated four quadrants arranged between four cardinal points. The cardinal points, designated by the terms Nadir, Ascendant, Zenith and Descendant, indicate respectively the facts derived from observation, the empirical laws derived from experimentation through the inductive process, the fundamental laws formulated with the aid of intuition and finally the laws derived through deductive logic. The first of the four quadrants corresponds to a stage in which the "primary senses are used either in their native state or with the aid of instruments of various degrees of powerfulness". The second quadrant indicates a phase in which the "intellect is used either by itself or aided by machinery constructed to speed up the work of the intellect and to give relief to it in some measure". The third quadrant represents a phase in which the "intuition of some intensity or other is used unmediated by the primary senses or the intellect". Finally, the fourth quadrant corresponds to a phase in which "reasoning is made with the aid of deductive logic including semantics, and mathematical and other

different from others – *i.e.*, the element of *anuvṛtti* in the former case and of *vyāvṛtti* in the latter case" (1932: 218). On this subject, see Bronkhorst 2011: 373-376.

[72] The triadic structure of knower (*jñātṛ*), knowledge (*jñāna*) and known (*jñeya*) is accepted by several Indian philosophical traditions.

[73] An early version of the scientific method without reference to the spiral can be found in *Social Bibliography or Physical Bibliography of Librarians* (R. 1952b: 54-55).

calculuses to work out all the compelling implications of the fundamental laws". At the end of the last phase, the spiral of the scientific method starts a new cycle, beginning with the first quadrant, in which the validity of the newly deduced laws is verified empirically (R. 1957b: 21-23).

The version of the spiral of the scientific method was re-proposed in the same year in the second edition of *The Five Laws of Library Science*, within the eighth chapter entitled "Scientific Method, Library Science, and March of Digvijaya", which had not appeared in the previous edition. Here Ranganathan again associated intuition with the principle of the *vastutantra* and called *tapas* the method by which this faculty could be acquired (R. 1957a: 358):

> This mode is called *Vastu-Tantra* in Sanskrit. It is said to be acquired by *Tapas*, a method of concentration, self-sublimation, and self-development; and it means "Knowee- Dependent".

He based all his work back to the *Five Laws of Library Science* and the principle of *eka-vākyatā* (R. 1957a: 382):

> The integral quality of the entire domain, with the focus on the Five Laws at the zenith of the spiral of scientific method, is well reflected in the family of about four dozen books of mine. The ancestor of this family is the *Five laws of library science* (1931). All the books form a single unit. Indeed they are like chapters of one huge book. They satisfy the test of the *Ekavakyata* Principle of *Mimamsa sastra*, the science of exegetics.

Another version of the spiral of the scientific method appeared later in the third edition of the *Prolegomena to Library Classification*, in Chapter XC "Classification as a Science". Here, the cycle corresponding to the first two phases of the earlier version begins with an "Empirical Phase", in which inductive logic is applied. The second, corresponding to the third phase of the first version, is a "Hypothesizing Phase", which "is usually made by one endowed with a considerable intuition" (R. 1967b: 551). The third phase, the "Deductive Phase", is identical to the fourth phase of the original version, while the last phase, a sort of "Verification Phase", is reminiscent of the first phase of the same (R. 1967b: 552).

4.3. The Five Fundamental Categories

In the first editions of the *Colon Classification*, the facets were "named variously in different main classes" (Satija & Singh 2013: 266). In the fourth edition, published in 1952, these were named Personality, Matter, Energy, Space and Time. As already mentioned, the first exposition of the five fundamental catego-

ries was formulated in *Library Classification: Fundamentals & Procedure*, a work completed by Ranganathan in the last years of his stay in Madras (R. 1944: 429-430)[74]:

> An examination of the facets of different subjects shows that they can all be related to one or other of five fundamental categories: Time, Space, Energy, Matter and Personality. Any analysis ultimately strikes root in them.

Another exposition is found in the second edition of *Elements of Library Classification* (1960b), based on lectures given at the University of Bombay in December 1944 and those delivered at the Schools of Librarianship in Great Britain in December 1956. In the eighth chapter, entitled "Facets Analysis: Fundamental Categories", Ranganathan presented eleven postulates, the first of which related the concepts of "facet" and "focus" to the five fundamental categories (R. 1960b: 67):

> Each facet of any subject can be deemed to be a manifestation of one and only one of the Five Fundamental Categories – Personality, Matter, Energy, Space and Time. We may call a facet a general manifestation, and a focus in it a particular manifestation, of the fundamental category concerned.

He then emphasised the relevance of the ineffable category of "Personality" and the method of identifying it, which he called the "Method of Residues" (R. 1960b: 68):

> The category Personality is, however, a rather difficult concept. It is often only recognisable by elimination. After separating out the manifestations of Time, Space, Energy and Matter in a subject, the residue will often turn out to be Personality. For the residual facet must be a manifestation of one of the five fundamental categories, and by assumption the manifestations of all the other four fundamental categories have been separated out before reaching the residue. This may be called the Method of Residues.

[74] "In 1948, a small beginning in pursuit of the foundation of the Faceted Classification had been made in London. D J Foskett, Bernard I Palmer, A J Wells, and myself spent a whole Sunday in Chaucer House, the then Headquarters of the British Library Association, in experiencing the subject. Eventually this led to the formation of the Classification Research Group of London. The Delhi Circle and the London Group regularly exchanged ideas. Further, this exchange intensified during my occasional visits to London" (R. 1967b: 27). "In 1955, the recently formed Classification Research Group (CRG) of the UK issued a statement which was published in the *Library Association Record* (Classification Research Group, 1955) and which proclaimed their desire to see faceted classification as the basis of all information retrieval" (Broughton 2006: 49).

In formulating this "method" Ranganathan drew on the well-known formula used in the *Bṛhadāraṇyaka Upaniṣad* to indicate the inexpressible dimension of the Absolute Principle (*ātman*/*Brahman*), "not this, nor this": *neti neti* (R. 1960b: 81)[75]:

> We have by now seen enough to say that Personality is an ineffable or undefinable fundamental category. That is why we have to locate it by the method of residues – that is locate it as the residue which is left over after the removal of all the [T], [S], [E] and [M] from the fully expressed name of the subject. This really amounts to a negative way of picking out the [P]. Such a negative way is known to be the only way open to recognise or point out any ineffable entity. In the Vedic tradition, God is defined only in such a negative way. "Not this, not this" is the translation of the Sanscrit name given to this method of definition and recognition[76].

4.4. Mystic picture of Reference Service

The appreciation of the reference service formulated by distinguished scholars such as Edward B. Ross, Kuppuswami Sastri, Pazhamaneri Sivaswami Ayyar (1864-1946), a prominent lawyer in Madras, and Frederic Henry Gravely (1885-1965), director of the Government Museum in Madras, confirmed the social value of this activity (R. 1961: 37). Ranganathan then decided to prepare an updated edition of *Reference Service*, covering the same topics as parts 1-3 of the first edition, with the addition of eighteen chapters. Published in 1961, the book is divided into ten parts (A-K), with a total of 66 chapters, and is illustrated by 167 case studies[77]. Part E of the volume, significantly entitled "Mystic Picture of Reference Service", contains five new chapters entirely devoted to the Indian tradition.

The first chapter starts by emphasising the importance of the "primacy of literacy" in society with a quotation from the medieval grammarian and poet Daṇḍin (R. 1961: 172):

> The primacy of literacy in the well-being of society is now beyond question. Dandin, a literary critic of medieval India, clinched this idea in the epigram,
> Literacy is the Cow giving anything wished for[78].

[75] *Bṛhadāraṇyaka Upaniṣad* 2.3.6. On this issue, see Rigopoulos 2015: 103-104.

[76] In the school of Advaita Vedānta, this device is known as *apavāda* (Freschi 1989: 101-102).

[77] In comparison with the 1940 edition, two further quotations from Sanskrit literature have been added: one from Vātsyāyana's *Kāmasūtra* 2.2.32 (R. 1961: 49); the other from Vālmīki's *Rāmāyaṇa* 2.91 (R. 1961: 178).

[78] Daṇḍin, *Kāvyādarśa*, *Pariccheda* 1.6.

The chapter also highlights the particularities of the language of poets, mystics or seers of ancient and modern times (R. 1961: 175):

> The words of a poet, a mystic, or a seer are charged with undertones and overtones. His words are scintillating. He uses analogies. He uses word-pictures of profound qualities. His words, his analogies, and his word-pictures appear to struggle to communicate the whole in itself and by itself. Their suggestions are endless[79].

The second chapter, "Light from the Vedas", opens with a free quotation from the *Taittirīya Upaniṣad*, in which the exhortation to a student who has completed his studies is related to a reference librarian (R. 1961: 177):

> The reader-guest is supreme to you.
> Give him service with all attention and in all sincerity.
> Give him service to the entire capacity at your command.
> Give him service in all modesty and in full freedom from any touch of prestige or ego.
> Give him service in full measure lest there should be any offence to the Laws of Library Science.
> Acquire the best of knowledge and information for giving him in your service[80].

The third chapter, "Light from Valmiki", attempts to identify the ideal of the reference service in the first book of the *Rāmāyaṇa*. Just as the sage Vasiṣṭha invokes his cow to give him whatever he wants, so libraries should have copies of all published documents (R. 1961: 178):

> O! Potency in perfection!
> Come, come immediately and listen.
> O! Cow giving anything asked for,
> The result of all my penance,
> Shower forth expeditiously unto each
> All that each individually wants
> From all the best in the six-fold essence[81].

[79] He then goes on: "A truly mystic communication in word-picture stems from the seminal level. At the seminal level, many entities of the phenomenal level coalesce. In other words, a picture drawn at the seminal level can manifest itself in a variety of forms at the surface level. It can truly represent and communicate several phenomenal entities. Therefore, the same word-picture of a poet, a mystic, or a seer can yield a fuller comprehension of different entities when viewed in different subject-contexts. That is why a profound mystic text, such as the Vedas, admits of nearly consistent interpretation, as if it were at once a text on each of several subjects, such as Library Science, Astronomy, Geology, Anatomy, Music, Psychology, Education, History, Political Science, Economics, Sociology, or Law" (R. 1961: 175).

[80] *Taittirīya Upaniṣad* (*Śīkṣāvallī*) 1.11.2-3.

[81] *Rāmāyaṇa* 1.52.21-22.

The same sage Vasiṣṭha is mentioned in relation to the four sons of King Daśaratha, Rāma, Bharata, Lakṣmaṇa and Śatrughna, as possible models for those who devote themselves to reference service (R. 1961: 179):

> The main theme of the *Ramayana* is the descent of God as humans amidst humans, for cleansing the hearts and minds of the humans and establishing peace and order in the world. God appears as the four sons of king Dasaratha. The sage Vasishta, the premier and the high priest of the kingdom, names them Rama, Bharata, Lakshmana, and Satrugna respectively.

The fourth chapter, "Light from the 'Mother' of Aurobindo", revisits the concepts of the trinity (*puruṣa*, *prakṛti* and *śakti*) mentioned in earlier works and identifies in the attributes of the goddess Śakti the ideal qualities for the reference librarian. In the course of his service, the librarian should remove any taint of selfishness, greed for personal gain and self-referential desire. His exclusive aim should be to establish contact between the books and the readers (R. 1961: 181):

> The reference librarian should allow nothing to creep in to stain the purity of the self-giving. His only object in action should be to serve, to fulfil, and to become a manifesting instrument of the Divine *Sakti* in her works. There must be no pride of the instrument, no vanity, no arrogance. The books constitute *Purusha* as *Akshara Brahma* (= scriptal form of God). The readers constitute *Prakriti* manifesting itself as *Manushya Prakriti* (= human manifestation of nature).

In the last chapter, "Light from Sanskrit", a number of Sanskrit terms relating to different aspects of reference work were analysed: library (*granthālaya*), library building (*pustakālaya*), librarian (*granthālayi*), protector of books (*pustakālaya-pāla*, or *pustaka-pāla*, or *granthālaya-pāla*, or *grantha-pāla*), reference service (*anu-laya-seva*), reference service worker (*anu-laya-sevi*) (R. 1961: 185-186).

4.5. The Documentation and its Facets

Returning to Bangalore after his stay in Zürich, in 1962 Ranganathan founded the Documentation Research and Training Centre (DRTC), under the auspices of the Indian Statistical Institute, to continue his research in the field of information science[82].

[82] The Documentation Research and Training Centre was the result of the vision of the Indian scientist and statistician Prasanta Chandra Mahalanobis, who had pointed out the need to develop a documentation service in India based on continuous research. Ranganathan was an honorary professor at this Centre from 1962 until his death.

The beginning of Ranganathan's interest in documentation dates back to 1950, when he visited various industrial and research centres in the United States at the invitation of the Rockefeller Foundation[83]. In his article *Documentation*, published in the journal "Libri" in 1951, he had already attempted to define the characteristics of a "Documentation Centre", which he thought should include not only "Documentation Work" and "Documentation Service", but also "Translation Service": "Whichever be the means by which the reading material is made accessible to the reader, in case he does not read the language (= Subtle Body) in which the thought (= Soul) is embodied, Translation Service becomes a necessity" (R. 1951b: 255).

In *Documentation and its Facets*, published in 1963, Ranganathan reported four standards of exposition recognised in Vedic tradition[84]. The first standard, called *prabhu sammita*, deals with "documents of a fundamental nature" that emanate from master minds. "Such master minds are very few, of course. These are self-centres of illumination. Their creation is spontaneous. Their writing is elusive. It scintillates. It has a message. The message is often found between lines and between words. […] The formulation of the Five Laws of Library Science and of the Five Fundamental Categories as the basis of classification may be taken to be of this standard" (R. 1963: 33-34). The second standard, called *suhrith sammita*, refers to the output of high-level intellectuals who create new knowledge through their research: "some of the papers appearing in the *Annals of library science* are of this standard" (R. 1963: 34). At a lower level, intended for non-specialists, is the standard called *kantha sammita*. Finally, the fourth standard, known as *sisu sammita*, concerns elementary documents (R. 1963: 34-35).

In the light of this new interpretation, Ranganathan revised the five laws formulated in 1931 by replacing "book" with "document". The new five laws were: 1. Documents are for use. 2. Every reader his document. 3. Every document its reader. 4. Save the time of the reader. 5. A library is a growing organism (R. 1963: 43).

Another interesting reference to the Vedic tradition appears in the essay *Library Classification through a Century*, published in 1965, in which the four main classes of knowledge of the Vedic scheme "correspond roughly and successively to our modern partially comprehensive classes" (R. 1965b: 3):

[83] During his stay he attended the annual conference of the Special Libraries Association in Atlantic City and the Medical Libraries Conference in Boston. He also had the opportunity to test the potential and limitations of documentation work at the Nickel Company and the Texas Oil Company (R. 1963: 18).

[84] To these four standards, Ranganathan added two others not mentioned in the Vedic tradition, called "Reporting Document" and the "Managerial Document" respectively (1963: 35). For a description of these standards of exposition see Neelameghan & Parthasarathy 2008: 15-16.

1 Religio-Social Sciences with Law as an auxiliary (= *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*).

4.6. The Prolegomena to Library Classification*: A New Edition*

Thirty years after the first publication of the *Prolegomena to Library Classification*, Ranganathan prepared the third edition. Already the second edition of 1957, which had taken almost ten years to complete, contained many new parts based on research work done since 1937 (Vickery 1958: 219). However, the third edition was not a revision of the previous ones[85]. The structure of the work was completely redesigned. In the place of 8 parts and 64 chapters of the second edition, this edition had 23 parts (A-W) and 187 chapters. In part A, "Introduction", Ranganathan outlined the main purpose of his work (R. 1967b: 34):

> I was not satisfied with the extent to which my books had been conforming to the Principle of Unity of Idea. This Principle should be all-pervasive. Apart from each sentence, each paragraph, and each section satisfying the Principle at their respective levels, each chapter also should satisfy the same Principle at a higher level. Further, the chapters themselves should be grouped into different parts, each part conforming to the Principle at a still higher level. In this edition, I seek to implement these ideas.

In part K "Canons for Mnemonics", part Q "Classification as Transformation", and part X "Reflections", he reintroduced some basic "concepts" of his system, derived to some extent from his Hindu philosophical tradition.

4.6.1. The Apupa Model

The acronym Apupa defines a model for arranging documents on the shelves in a regular pattern. According to this model, there are three regions designated as umbral (U), penumbral (P) and alien (A): A is an alien or related area; P is a partly-relevant area; and U is the area containing the main documents on the subject (Satija 2017: 301-302; Giusti 2018: 380-381; Gnoli 2018: 675). The Apupa model was first presented in *Classification and Communication* (1951) and proposed again in *Reference Service* (1961) and in the third edition of the

[85] Some parts of the second edition were destined for two other volumes *Classification: Retrospective and Prospective* and *Depth Classification and its Design*, to be published later (R. 1967b: 34).

Prolegomena (1967). Ranganathan underlined the importance of the Apupa model with this remark (R. 1967b: 384):

> As he glances from one end to the other of his total Region, the reader will pass successively through the Alien, the Penumbral, the Umbral, and again the Penumbral and the Alien Subjects. This is Apupa Arrangement. It is such an Apupa Arrangement that will give that reader the greatest satisfaction at the moment in full conformity to all the Five Laws of Library Science.

4.6.2. Seminal Mnemonics

Inspired in 1932 by the Śaṅkarācārya of the Kāmakoṭi Pīṭha of Kāñcīpuram in Tamil Nadu[86], Ranganathan formulated an important classification principle, which he called "unscheduled mnemonics" in the first edition of the *Prolegomena* (Rahman & Ranganathan 1962: 54). Later he used the term "primordial" to denote this principle, in the second edition of the *Prolegomena* he adopted the term "seminal mnemonics", and in the third edition he traced these deep mnemonics back to a forgotten tradition (R. 1967b: 304):

> In the mystic tradition of Chaldea and India, many such equivalences are believed to have been recognised. I have not yet been able to get hold of that tradition. It gives seminal mnemonic significance to letter as well as numerals. A correct knowledge of it will make the use of digits conform with seminal mnemonics. The forgotten tradition needs to be re-captured.

The principle refers to the ability to refer to something independently of its verbal designations[87]. In Ranganathan's view, the identity of a seminal concept "is cognizable at great depths, beyond the reach of natural language" (R. 1967b: 304):

> In scheduled mnemonics, the same concept is represented by the same term and the same number, in all its places of occurrence. It is also possible to have the same concept represented by the same *number* in all places of occurrence, but with different *terms* denoting it in the different places. The identity of the concept is cognizable at

[86] He was Candraśekharendra Sarasvatī, Jagadguru Śaṅkarācārya of the Kāñcī Kāmakoṭi *pīṭha* at Kāñcīpuram in Tamil Nadu. This last is added to the four *pīṭha*s (known as *maṭha*s), which according to tradition Ādi-Śaṅkara established during his *digvijaya* in India, for the purpose of promoting *advaita* philosophy: Dvārakā, in Gujarat; Jagannāth Purī, in Orissa; Jyośimaṭh, near Badarīnāth, in Uttaranchal; and Śṛṅgerī, in Karnataka (Clark 2006: 2).

[87] In his classificatory activity, Ranganathan defined three planes of work: the idea plane, related to the mind, seen as "the place of origin of ideas"; the verbal plane, where the "capacity to develop an articulate language as medium for communication" is dominant; the notational plane, where "words are often replaced by symbols pregnant with precise meaning" (R. 1967b: 327).

> great depths, beyond the reach of natural language. As and when the concept came up to the surface in particular contexts, a word in the natural language has been coined to denote it in that context. At the unmanifest depth of identity, there has been no need to denote that seminal concept by a term in the natural language[88].

4.6.3 Absolute Syntax

Another outstanding principle introduced by Ranganathan is that of "absolute syntax". The idea of "absolute syntax" was proposed in November 1958 at the "International Conference on Scientific Information" (Washington), and later on 11 June 1966 at the International Symposium on "Relational Factors in Classification", sponsored by the University of Maryland (Neelameghan & Raghavan 2012: 43). According to Ranganathan, "absolute syntax" is the sequence in which "the facet ideas of a subject – corresponding to the kernel terms in its full expressive name – arrange themselves in the minds of the majority of persons" (R. 1967b: 579). In his view, "absolute syntax" and syntax of facets coincide (R. 1967b: 580-581):

> In general, the number of Linguistic Syntax for the name of a subject, in the different natural languages all taken together, can become as great as factorial n, where n is the number of kernel terms in the name of the subject. But there is only one Syntax of Facets. For this reason, it is conjectured that the Syntax of Facets is the same as "Absolute Syntax". This implies that the Absolute Syntax is the one conforming to the Postulates and Principles guiding the design of an Analytico-Synthetic Classification. Perhaps, it is more appropriate to say that the postulates and principles guiding an Analytico-Synthetic Classification conform to the Absolute Syntax.

4.6.4. Mysticism and Intuition

In *Prolegomena*, as in other works, Ranganathan distinguishes between intellect and intuition[89]. In his own words, the former "cannot apprehend anything in its entirety", the latter is "spontaneous and sudden. It shows no stages. It transcends methodology of any kind". To these two faculties he added a third one, the flair,

[88] On seminal mnemonics see Subramanyam 1976: 16-18; Neelameghan & Raghavan 2006: 226-228; Neelameghan & Raghavan 2012: 44-45; Dousa 2019: 164-165.

[89] The distinction between intellect and intuition was the focus of Sarvepalli Radhakrishnan's research in the 1930s, which Ranganathan was probably aware of. He was a professor at the University of Madras from 1909 to 1918, then moved to Mysore, Calcutta and, as we have already mentioned, Varanasi. In his volume *An Idealist View of Life*, published in 1932, he included lectures given at the University of Manchester in December 1929 and at University College London in January 1930 (chapter IV was entirely devoted to the subject of intellect and intuition). In 1933, he also published the article *Intellect and Intuition in Sankara's Philosophy*, in the journal "Triveni", July-August 1933.

which is "the limiting point between intellection and intuition, but belongs to neither" (R. 1967b: 550):

> In its partial apprehension and failure to perceive the thing-in-itself, flair is on the side of intellection. In its apparent spontaneity and suddenness, it is on the side of intuition. In fact, it is the limiting point between intellection and intuition, but belongs to neither[90].

As we have seen, Ranganathan had already specified that the term used in the Sanskrit tradition for intuition is *divya-cakṣus*, literally "divine eye", and had associated it with a state of deep absorption, called *samādhi*. He had also mentioned the Sanskrit term *tapas* to indicate the means by which this mode of knowledge can be developed. All this is also emphasised in the *Prolegomena* (R. 1967b: 550):

> In Indian tradition, this integral, time-free, space-free realisation is said to be achieved through spiritual exercise or *tapas*. It speaks of "transcendental sense" – *divya indriya*. […] Intuition is spontaneous and sudden. It shows no stages. It transcends methodology of any kind.

Another valuable testimony to the key role Ranganathan ascribes to intuition is found in a letter to M.S. Venkataramani, in which he regards it as the basis of spiritual and mystical experience (Kumar 1998: 200-201 B3-B6):

> Spiritual experience or mysticism is rooted in intuition. Cent per cent intuition enables one to apprehend thing-in-themselves, and things in-entirety, quite unmediated by intellect or primary senses. A few persons are born with cent per cent intuition. Ramana Maharshi is an example of modern time. Anandamayi is another. I am sure you know about Ramakrishna Paramahamsa. All through the centuries, India has had such born mystics and their memory is still preserved by society, though the new generation is not familiar with their lives as those on my generation and the earlier ones. In the case of other persons, intuition may vary from a mere momentary one or

[90] Commenting on the function of intuition within his classification system in the article *Areas for Research in Library Science*, he stated that the "Canons of Faceted Notation and of Seminal Mnemonics are intuition-based; and the other Canons and all the Devices are intellect-based" (R. 1967a: 309). For a critical review of the function of intuition and flair in Ranganathan's system see Chappell: "Thus the method Ranganathan used to develop the principles on which his classification system is based is finally not describable or teachable or subject to intellectual test. The efficacy of the classification system depends simply on Ranganathan's own flair, on the truth of his intuition. To those lacking faith in his inspiration, the principles seem as likely to be rooted in idiosyncrasy as in metaphysical reality. Moreover, any addition to, or modification of, the basic rules must be contingent on the availability of classificationists who share Ranganathan's power of intuition" (1976: 393).

> a speck at one end through all percentages until we reach cent per cent stage. Those that have only fractional intuition will have to do much of intellectual work before intuition is spontaneously released for a short while. It is during this short period that most of the discoveries, inventions, formulation of fundamental laws etc., are made. But after the intuitive spell passes away, these very persons will have to follow up the results of intuition by persistent intellectual work. The industry of such people is immensurable. Newton is a historical example. Our mathematical Ramanujan was an example within my knowledge.

Speaking of his own personal case, Ranganathan explains in the same letter how the foundations of his theory of classification were seen in these moments of intuition (Kumar 1998: 201 B7):

> In my case, in the present subject of my interest, I have had split moments of experience of intuition. My Five Laws of Library Science were "seen" in this new way. My own other postulates, forming the foundation of my theory of library classification were seen like that. I had to slave a good deal to understand the why and wherefore of certain facts of experience. But when the intellect had done its best, and it appears for a split second and gives the postulates etc., once they are handed over by intuition, intellect had to work out their implications for days and days with hardly any sleep, for example, continuously for a few days. My theory of library classification published as Prolegomena to Library Classification has been worked out in this way.

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