Thomas M. Dousa — University of Chicago Library

S.R. Ranganathan's Ontology of the Book: On a Bibliographical Conceptual Model *avant la lettre*

Abstract

This paper examines a conceptual model of the book advanced in the mid-20th century by the eminent Indian librarian and classification theorist S.R. Ranganathan (1892-1972), who formulated it with the aid of an ontological model drawn from Hindu philosophical thought. The analysis of this model, which has hitherto received only sporadic discussion in KO literature, unfolds in three parts. First, the paper outlines Ranganathan's model, explains its Hindu philosophical background, and traces its development, showing that, in fact, it comprised two distinct versions – a triadic (i.e., three-entity) and a dyadic (i.e., two-entity) one – which were fully compatible to one another and which Ranganathan used in different contexts. Next, the structure of Ranganathan's model, in both its triadic and dyadic forms, is compared with those of the contemporary bibliographic conceptual models most widely used today, IFLA-LRM (and its predecessor, FRBR) and BIBFRAME. It is shown that Ranganathan's model bears some striking resemblances to these current models: in particular, the triadic version of Ranganathan's model shares affinities with FRBR and IFLA-LRM, while the dyadic version is closer to BIBFRAME. Then follows a discussion of significant structural divergences between Ranganathan's model and its latter-day counterparts, and an explanation for these differences is adduced. The paper concludes with a brief consideration of the surprising lack of historical connection between Ranganathan's conceptual model of the book *avant la lettre* and current bibliographic conceptual models, as well as a reflection on the enduring relevance of Ranganathan's model for today.

Introduction

At present, the intellectual framework for bibliographic description in libraries is largely defined by bibliographic conceptual models, such as the IFLA Library Reference Model (henceforth, IFLA-LRM) (Riva, Le Boeuf, & Žumer 2017) and its predecessor, the Functional Requirements for Bibliographic Records model (henceforth, FRBR) (IFLA Study Group on the Functional Requirements for Bibliographic Records 1998), which provide the theoretical underpinning for the RDA (Resource Description & Access) cataloging standard (Croissant 2012), and the Library of Congress's BIBFRAME model (Library of Congress, 2016), which has profoundly affected the development of experimental linked-data cataloging tools in recent years.[1] These conceptual models have been formulated in accord-ance with specific modelling standards: FRBR and IFLA-LRM are based on entity-relation-ship (E-R) modelling techniques (Coyle 2016, 75-76), while BIBFRAME takes as its framework the Resource Description Framework (RDF) linked data model (MacCallum 2016). Despite differences in detail, all of these conceptual models share in common an analytical approach that resolves the bibliographic universe into three basic elements – *entities*, the *attributes* of entities, and the *relationships* between entities (IFLA Study Group on the Functional Requirements for Bibliographic Records, 9-10; Riva, Le Boeuf, & Žumer 2017, 17; Library of Congress, 2012, 9) – and takes as its focus so-called bibliographic entities – *Work*, *Expression*, *Manifestation*, and *Item* (WEMI) in FRBR and IFLA-LRM, and *Work* (hereafter, bf:Work), *Instance* (hereafter, bf:Instance), and *Item* (hereafter, bf:Item) in BIBFRAME – and the relationships between them.

---

[1] Strictly speaking, one should distinguish between the original version of BIBFRAME, which was unveiled in November 2012 and the current version, BIBFRAME 2.0, which was adopted in 2016 and has continued to evolve since then, as there are some significant differences in constellation of entities forming the backbone of the model (cf. Library of Congress 2012, 8-15 with Library of Congress, 2016). In this paper, I shall focus primarily on BIBFRAME 2.0, but , for the sake of simplicity, shall refer to it as "BIBFRAME".

The E-R approach to conceptual modelling is a relatively new development within the field of bibliographic description. Drawing upon data-modelling techniques first developed in the mid-1970s and 1980s (Coyle 2016, 33-34, 69-70), it appears to have been first applied to analysis of the bibliographic universe in the years around 1990 (e.g., Svenonius 1992; Tillett 1991). RDF-based versions of this approach are even more recent, emerging in library discourse shortly before 2010 (Kroeger, 2013, 879-880). The association of current concept-ual models with these particular formal techniques could easily lead to the perception that bibliographic conceptual modelling as such is a late 20th and early 21st-century development in the history of knowledge organization (KO) that constitutes a radical break with the past. If one understands bibliographical conceptual modelling to be narrowly defined by the E-R formalisms that it uses, such view is justifiable. If, however, one considers bibliographic conceptual modelling not primarily as a data-modelling technique but, more broadly as any intellectual attempt to isolate and characterize, formally or informally, bibliographic entities, the attributes of those entities, and the relationships between them, then it is possible to identify bibliographic conceptual models in earlier phases of the history of knowledge organization. For example, at the beginning of the second decade of the 20th century, the English librarian Wyndham Hulme (1859-1954) developed a model of the book in the form of a classification of different kinds of book attributes, which, interestingly, mirrored many of the distinctions made in current bibliographic conceptual models but structured them in a way quite distinct from the latter (Dousa 2017). More recently, in the third quarter of the 20th century, the eminent American cataloging theorist Seymour Lubetzky (1898-2003), arguing that catalog design should take into account the distinction between the book as a material object and the work as an intellectual product embodied in books,[2] posited that individual books represent particular editions of given works, thus limning the outlines of a bibliographic model distinguishing between the *work*, the *edition*, and the *book*:[3] here, again, it is not difficult to find analogies with bibliographic conceptual models in use today.[4] Although neither Hulme nor Lubetzky used the term "model" to refer to their respective schemes nor did they rely on formal modelling techniques to develop their ideas, each in his own way used conceptual analysis to identify bibliographic entities, to enumerate and organize their attributes (Hulme), and to posit relationships between them (Lubetzky). For this reason, the informal models of books that they created can be termed bibliographic conceptual models *avant la lettre*.

In this paper, I wish to examine yet another early conceptual model of the book *avant la lettre*, one that was advanced in the mid-20th century by the eminent Indian librarian and classification theorist S.R. Ranganathan (1892-1972). This model has received some discussion

---

[2] See Lubetzky 2001 [1969], 270 (emphases his): "The book, it should be noted, comes into being as a dichotomic product—as a material object or medium used to convey the intellectual work of an author. … [T]he material *book* embodies and represents the intellectual *work* … ." These statements can be represented formally as "Work<is embodied/represented by>Book". In making the distinction between "book" and "work", Lubetzky drew on a theoretical tradition inaugurated by Julia Pettee, who, in 1936, distinguished between individual books and "literary units", and developed by Eva Verona, who, in 1959, drew a contrast between "bibliographical units" and "literary units". According to Pettee, this distinction was already being made implicitly in Thomas Hyde's 1674 catalog of the Bodleian Library and in Antonio Panizzi's 1841 Rules for the British Museum Catalog. From this perspective, Lubetzky's dyadic contrast between "book" and "work" can be viewed as the culmination of a long development in Anglo-American cataloging tradition, for overviews of which see, e.g., Denton 2007, 37-49; Smiraglia 2001, 15-33; Svenonius 2000, 8-9.

[3] See Lubetzky 2001 [1969], 271 (emphases his): "[I]t must be recognized that, genetically, a *book* is not an independent entity but represents a particular *edition* of a particular *work* by a particular author …". Here, again, these statements can be formally expressed as "Work<has>Edition" and "Edition<is represented by>Book".

[4] More specifically, Lubetzky's model appears to have affinities with the BIBFRAME model, with Lubetzky's work analogous to bf:Work, his edition correlating to bf:Instance, and his book mirroring bf:Item.

in KO literature (e.g., Bianchini 2015, 165-167; Gnoli 2016, 405; Tennis 2011, 126, n. 11; Varghese 2008, 286-287) but it has not been the object of a full-scale study. And, yet, it deserves sustained attention for three reasons. First, Ranganathan formulated it with the aid of an ontological model he adapted from Hindu philosophical thought: it thus offers a striking example of an analysis of bibliographic entities rooted in a cultural background quite different from that of the Anglo-American tradition of bibliographic description from which our current bibliographic conceptual models have emerged. Second, as we shall see, Ranganathan developed two different versions of this model – one with three entities and another featuring only two entities – that were, nevertheless, fully compatible to one another. To do so, he made use of a technique analogous to that of reification in conceptual modelling. Previous studies have only considered the model as a finished product and so have not considered its variant versions: it is thus both interesting and worthwhile to trace its multiple developments across Ranganathan's written *oeuvre*. Third, the triadic version of Ranga-nathan's model bears some striking structural resemblances to FRBR and IFLA-LRM (hereafter, FRBR/IFLA-LRM), while the dyadic version adumbrates certain features of BIBFRAME, even though these two versions also exhibit some significant divergences from these contemporary bibliographic models. The similarities are all the more striking as there is no evidence of any relationship of influence between Ranganathan's model and the latter-day models that resemble it. In light of all this, Ranganathan's bibliographic conceptual model warrants close study. The exposition offered here will take the following form. First, I shall outline Ranganathan's model, explain the philosophical background of the idiom in which he couched it, and trace its development in his writings. Second, I shall compare its structure to those of FRBR, IFLA-LRM, and BIBFRAME, noting both similarities and differences. By way of conclusion, I discuss briefly the surprising lack of historical connection between the Ranganathan's model and these latter-day models, and reflect on the enduring significance of Ranganathan's ontology of the book for KO.

Ranganathan's Ontology of the Book: Historical Background and a First Glance
From 1947 until 1954, Ranganathan served as professor of library science at the University of Delhi (Almeida 2022, 104-106; Bianchini 2015, 42-44). Following upon a strenuous two-year period during which he had almost single-handedly (re)classified the library at Banaras Hindu University in Varanesi (Benares), his tenure at Delhi afforded him scope to devote himself fully to teaching and research. It is within this context of relative academic leisure that Ranganathan appears to have developed his ontology of the book. There are indications that he had incorporated elements of it into his lectures as early as 1948 and he alluded to it in an article on documentation published in the journal *Libri* in 1951 (Ranganathan 1948, 38-39, 73; 1951, 254-255; 1992; 305, 307). However, it made its first full appearance in three books that Ranganathan published in 1952: *Library Book Selection* (hereafter, *LBS*); *Social Bibliography, or, Physical Bibliography for Librarians* (hereafter, *SB*); and *Social Education Literature for Authors, Artists, Publishers, Teachers, Librarians, and Governments* (hereafter, *SEL*) [5] Ranganathan (1952a, 10; 1952b, 12; 1952c, 10) con-sidered these three books to be complementary to one another, to form "a small family" as it were. Although each of these volumes addressed a different theme, all three required, in the course of their exposition, that Ranganathan present his understanding of what a book is.

---

[5] *LBS* came out in a second, substantively augmented, edition in 1966, while a second edition of *SB*, produced with the aid of A. Neelameghan, appeared in 1974 under the title *Physical Bibliography for Librarians*. In the following discussions, I shall cite the texts of both editions of these works.

According to Ranganathan (1952a, 21; 2006 [1966], 77), a book is not a unitary entity but rather has a "composite nature". By the same token, the concept of a book is polyvalent, in the sense that "[w]hen the term 'book' is uttered, it may bring to mind one or more of several ideas" (1952b, 22; 1974, 18). More specifically, the idea of a book is a "composite concept" (1952b, 22; 1974, 18) consisting of "three sub-ideas" (1952a, 21; 2006 [1966], 77). On hand, Ranganathan claimed, a book can be conceived as consisting of "thought-content" (1952b, 23),[6] which he assimilated to the "soul" or "*atma*" (1952b, 23; 1952c, 147; 1974, 20). The soul of a book encompasses the "subject matter" of which it treats (1952a, 21; 2006 [1966], 77)) and informs such properties of the book as its intellectual standard (1952a, 50; 2006 [1966], 103) and its form of appeal – that is to say, whether it is primarily informative, recreative, or inspirational for its readers (1952a, 54-56; 2006 [1966] 107-108).[7] Now the thought-content of a book requires a vehicle for communication, which is to be found in "language" as well as "pictorial aids and diagrams" (1952b, 22; 1974, 19). Ranganathan considered such means of communication to constitute a "*subtle medium*" (1952b, 22; 1974, 19 emphasis his), which he characterized as the "subtle body", or "*sukshma sarira*", of a book (1952b, 23; 1952c, 147; 1974, 20). The subtle body of a book, in his estimation, is characterized by such properties as the style, clarity and quality of its language and illustrations, and the presence (or absence) of an index (1952a, 37-50; 2006 [1966], 90-102). Finally, the conceptual content formulated in language or pictorial matter requires a material support, the bound set of pages that make the book a tangible object. This Ranganathan characterized as the "gross body", or "*sthula sarira*", of the book (1952b, 23; 1952c, 147; 1974, 20). The properties of the gross body include such elements of its "physique" as its size, shape, weight, binding, durability, the quality of its paper, the formatting of its pages, and the legibility of its print (1952a, 22-35; 2006 [1966], 78-88). For Ranganathan (1952a, 21; 1952b, 23; 1952c, 147; 1974, 20; 2006 [1966], 77), then, the book is not simply a composite concept but rather constitutes a "trinity" consisting of three metaphysical parts:[8]

---

[6] In the second edition of *SB*, Ranganathan (1974, 19) changes this term to "idea-content".

[7] The qualities of intellectual standard and appeal are discussed most extensively in *LBS*. Standard of exposition, simply called "standard" in the first edition and "standard of thought" in the second, indicates whether the thought-content of a book is of the highest intellectual quality (i.e., "seminal material"), whether it contributes to ongoing specialized intellectual work (i.e., "research material"), whether it provides an introductory overview of a subject to non-specialists (i.e., "expository material"), whether it provides a rudimentary exposition of a subject to beginners ("elementary material"), or whether it simply states factual material in short compass without trying to explain it in great detail ("reporting material") (Ranganathan 1952a, 50-53; 2006 [1966], 103-105). Interestingly, in the first edition of *LBS*, Ranganathan left it ambiguous whether the standard of exposition belongs to the "soul" or the "subtle body" of a book, even implying in his paragraph numbering that the latter was the case; in the second edition, however, he unequivocally associated it with the "soul".

[8] I use the term "metaphysical part" here to refer to any component aspect, either material and immaterial, of a physical object – such as a book – as it presents itself to, or is represented in, the human mind and so reveals the conceptual structure of that object. In doing so, I adapt, *mutatis mutandis*, a term most often encountered in contemporary analyses of Scholastic philosophy; see, e.g, Brower, 2014, 130, n.1; Novák and Dvořák 2011, 44; Pasnau, 2011, 5-11.

Figure 1. The Metaphysical Parts of a Book according to Ranganathan
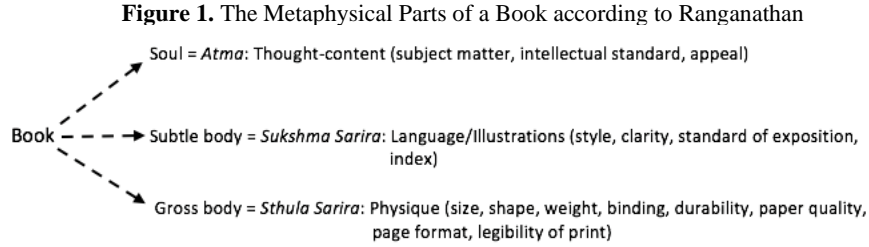
the "soul", or thought-content; "the subtle body", or the linguistic or pictorial representation of that content; and the "gross body", or physical carrier upon which this representation of the thought-content is imprinted (See Figure 1 above).

The Hindu Philosophical Background to Ranganathan's Ontology of the Book
The terms that Ranganathan uses to denote the three metaphysical parts of a book that he posits – "soul", "subtle body", and "gross body" – are translations of Sanskrit terms denoting specific Hindu philosophical concepts – *ātma, sūkṣma-śarīra,* and *sthūla-śarīra*,[9] respectively. Since these concepts – especially the latter two – are unlikely to be familiar to Western students of Ranganathan's thought, it is appropriate to consider briefly the original context from which he drew them. In Hindu philosophical thought, the *ātma*, the *sūkṣma-śarīra*, and the *sthūla-śarīra* are all parts of a *jīva*. Variously glossed as "the empirical self" (Dandekar 1962, 2), "empirical individual" (Gupta 2021, 430) or "the finite individual" (Malhotra & Babaji 2020, 47), a *jīva* is an individual being that stands in a first-person ("I") relation to the world. The concept of *jīva* is found in all major Hindu *darśanas* (i.e., philosophical traditions),[10] though interpretation of it varies considerably across these dif-ferent traditions (Grimes 1989, 152-156). The two Hindu philosophical traditions in which the concepts of *ātma, sūkṣma-śarīra,* and *sthūla-śarīra* as components of a *jīva* play the most salient role are Sāṅkhya and Advaita Vedānta.[11] Although the doctrines of these two *dar-śanas* differ from one another in a number of ways, here I shall mention only what is perhaps the most fundamental distinction between them in the realm of metaphysics: Advaita Vedānta holds a monist conception of the realm of being (Flood 1996,

---

[9] In contemporary scholarly literature, Sanskrit is generally transliterated using the International Alphabet of Sanskrit Translation (IAST), which, through use of diacritical characters, distinguishes graphically between all phonemes in Sanskrit, thus allowing for a very precise representation of the phonemic structure of words. On the other hand, when Ranganathan cited Sanskrit terms, he used the more traditional Hunterian system of transliteration. Initially developed by English linguists during the late 19th century, this system did not use diacritics and its representation of phonemes is thus less precise. In this paper, I have adopted the following strategy for representing Sanskrit words. When I quote Sanskrit terms within the context of a discussion of Hindu philosophical tradition, I use the IAST form of transliteration. When, however, I quote the terms in the context of Ranganathan's model, I use the Hunterian system that he used: more specifically, IAST *ātma* = Hunterian *atma*; IAST *sūkṣma-śarīra* = Hunterian *sukshma sarira*; and IAST *sthūla-śarīra* = Hunterian *Sthula sarira*. The rationale for making this distinction is that, while Ranganathan drew upon traditional Hindu concepts, he adapted them to his own specific ends and used them in a context quite distinct from the one in which they were normally used: by visually distinguishing representations of Sanskrit philosophical vocabulary in its original context from those found in Ranganathan's bibliographic discourse, I wish to foreground the "idiolectic" – and creative – nature of Ranganathan's use of those terms.
[10] On the various nuances of the term *darśana,* which derives from a verbal root meaning "to see", see Flood 1996, 224; Gupta 2021, 10; Hamilton 2001, 9. It could equally well be aptly translated as "perspective" or "worldview".
[11] For brief introductory characterizations of Sāṅkhya and Advaita Vedānta, see, e.g., Chatterjee & Datta 2016 [1968], 38-41, 46-49; Hamilton 2001, 112-117; 125-131.

204; 127), whereas Sāṅkhya adheres to a dualist ontology (Chatterjee & Datta (2016 [1968]), 38, 254).

In both Sāṅkhya and Advaita Vedānta, the general framework of existence within which *jīvas* have their being includes two foundational realms: that of *puruṣa* and that of *prakṛti*. The former of these – *puruṣa* – is generally glossed as "self" (Chatterjee & Datta 2016 [1968], 263), "spirit" (Grimes 1989, 279, 1 s.v. *Puruṣa*) or "consciousness" (Malhotra & Babaji 2020, 78). *Puruṣa* is "pure consciousness", existing changelessly, eternally, and apart from any empirical being (Chatterjee & Datta 2016 [1968], 263-264 ; Grimes 1989, 279, 1 & 3 s.v. *Puruṣa*). As "conscious spirit", *puruṣa* is inherently receptive and passive: it stands outside of any causal relations with any objects and is "above all change and activity" (Chatterjee & Datta 2016 [1968], 264). *Prakṛti*, on the other hand, is the "material principle" (Malhotra & Babiji 2020, 77) or the "primal matter" (Chatterjee & Datta 2016 [1968], 266) underlying all the objects in the world. Etymologically derived from a verbal root meaning "to do" or "to create" (Malhotra & Babiji 2020, 78), the term "*prakṛti*" refers to "the natural world of physical, mental, and emotional process, the coming to be and passing away of causally linked items, forces and phenomena" (Broadbeck 2003, xvi). Now Sāṅkhya and Advaita Vedānta part ways on the ontological significance of *prakṛti.* The former, as a dualist system, considers *prakṛti* to be "the primordial generative material principle which contains the whole universe" (Malhotra & Babiji 2020, 77; cf. Chatterjee & Datta 2016 [1968], 258) and so to be ontologically distinct from *puruṣa*, while the latter, following its monist orientation, understands *prakṛti* to be a principle of illusion (*māyā*) through which the unchanging and unitary being of *puruṣa* – identified with *paramātman*, the "supreme self", or, in Advaita Vedānta, with *brahman,* the very essence of the universe (Giles 1989, 247, s.v. *paramātman,* 279, 3 s.v. *puruṣa*)[12] – appears as the perceptible and manifold universe to the *jīvas* living within it (Chatterjee & Datta 2016 [1968], 368; Hamilton 2001, 128-131). For our purposes, it is sufficient to note that, in both systems, *puruṣa* – pure, passively receptive, consciousness and spirit – and *prakṛti* – the dynamic material principle underlying the perceptible world – are the two principles that, either ontologically (Sāṅkhya) or phenomenologically (Advaita Vedānta), characterize the realm of being.

The contrast between *puruṣa* and *prakṛti* provides helpful background for understanding the respective ontological statuses of the three component elements of the *jīva*. The first of these, *ātma*, which Ranganathan translated as "soul", is perhaps better glossed as "the essential or real self" (Dandekar 1962, 2), for it is "the true self of a [living individual being] revealed when stripped of all that is temporary, perishable, and subject to the limitations of space and time" (Malhotra & Babiji 2020, 54). *Ātma* is eternal, indestructible, immutable, and spiritual (Dandekar 1962, 4; Gupta 2021, 285; Malhotra & Babiji 2020, 54); it is "of the nature of pure self-consciousness, which is beyond all bodily and mental conditions" (Dandekar 1962, 4; cf. Gupta 2021, 285). In all of these respects, *ātma* possesses the qualities of *puruṣa* and, in fact, is identical to it. To be sure, Sāṅkhya and Advaita Vedānta differ in their understanding of how individual *ātmas* relate to the realm of selfhood as such. Advaita Vedānta holds the monist view that the essential selves of all living beings are but parts or manifestations of the single, unitary, and universal consciousness of *brahman*, while Sāṅkhya takes the contrary pluralist position that the essential self of each living being is distinct from the essential selves of all other living beings (Chatterjee & Datta, 2016 [1968], 265-266). At any rate, both *darśanas* consider the *ātma*, or essential self, to belong to the realm of *puruṣa*.

---

[12] On the concept of *brahman*, which is especially important in Advaita Vedānta see Flood 1996, 84; Giles 1989, 100, s.v. Brahman; Gupta 2021, 272-273.

By contrast, both the *sūkṣma-śarīra*, or "subtle body", and the *sthūla-śarīra*, or "gross body", are firmly entrenched within the realm of *prakṛti*. The subtle body encompasses such features of a *jīva* as its mind (*antaḥkaraṇa*), which includes the intellect or cognitive capacity (*buddhi*), the capacity to feel a sense of individuality or ego (*ahaṁkāra*), and the faculty of processing sensory data (*manas*), as well as its five faculties for perceiving objects in the world (*buddhindriyas* or *jñānendriyas*), its five faculties taking physical action (*karme-ndriyas*), and the five vital breaths (*prāṇas*) that animate the gross body (Chatterjee & Datta 2016 [1968], 267-273, 398, Dandekar 1962, 9) – that is to say, it provides the means for carrying out all the "vital, mental, and intellectual functions" of the *jīva* in this world (Dandekar 1962, 9). The gross body, on the other hand, is the physical body *tout court*. Composed of the five "gross elements" of ether, air, fire, water, and air, the gross body is firmly grounded in the material world, serving as "the support of the subtle body" while a *jīva* is alive (Chatterjee & Datta 2016 [1968], 271-272, 369). To persons holding a Western worldview, the assignment of the gross body, in all its physicality, to the material realm of *prakṛti* will seem perfectly natural and appropriate. The association of the subtle body with this realm, on the other hand, may seem less obvious, for the subtle body includes the mental and intellectual aspects of a *jīva* and so, *prima facie*, would seem to be essentially psychical and immaterial in nature (cf. Hick 1994, 136-137). Within Hindu thought, however, the mental and intellectual faculties of the subtle body are considered to composed of the same elements as the physical members of the gross body, albeit configured in finer proportions than the latter. Indeed, according to Advaita Vedānta, the five gross elements of which the gross body is comprised are derived from certain proportionate combinations of the five subtle elements making up the various parts of the subtle body (Chatterjee & Datta 2016 [1968], 369; Paul 1921, 151).[13] What is more, insofar as *prakṛti* is uniquely the realm of causality while *puruṣa*, as noted earlier, stands outside of all causal relations to the world, all perceptual, intellectual, and emotional effects experienced by the *jīva* in its dealings with the world belong to the world of *prakṛti.* An important corollary of this is that all perceptions of first-person consciousness experienced by a *jīva* in virtue of its possession of a subtle body occur within the realm of *prakṛti* as well. This entails that the empirical ego-consciousness of the *jīva* is distinct from the pure consciousness of its *ātma*, which, as we saw above, belongs exclusively to the realm of *puruṣa*.[14] There is thus an important ontological cleavage

**Figure 2.** The parts of a *jīva* in relation to *puruṣa* and *prakṛti*

---
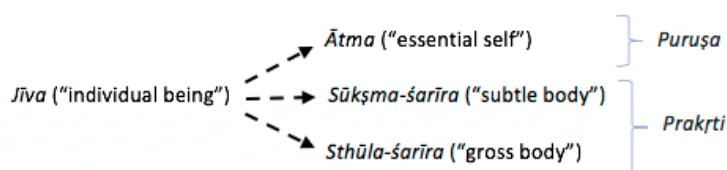
[13] By contrast, Sāṅkhya holds that the subtle body is composed of five *tanmātras* – "the subtle essence[s] of the five elements" (Grimes 1989, 1 s.v. *tanmātra*) –, from which are derived the five gross elements of which the gross body is made (Chatterjee & Datta 2016 [1968], 271; Majumdar 1925, 67-68).

[14] Cf. Dandekar 1962, 4: "The essential self [sci., the *ātma*--TMD] is identical neither with the body nor with the mind, … [T]he distinction between the self on the one hand and the body and senses, mind, intellect, and ego on the other is quite fundamental in Hindu thought"; See also Chatterjee & Datta 2016 [1968], 398-399.

that runs through the three component parts of a *jīva*: the *ātma*, or essential self, has the nature of *puruṣa*, whereas the *sūkṣma-śarīra*, or subtle body, and the *sthūla-śarīra*, or gross body, have their being in the realm of *prakṛti* (See Figure 2 above).

Within the framework of the distinction between *puruṣa* and *prakṛti*, the subtle body has greater ontological affinity with the gross body than it does with the *ātma*. There is, however, another context that places the subtle body in a much closer connection to the *ātma*. This is the doctrine of *saṃsāra* or the cycle of reincarnation (Dandekar 1962, 15-16; Flood 1996, 86; Grimes 1989, 308). According to this teaching, the existence of a *jīva* is not confined to a single life: rather, it undergoes a sequence of lives within a cycle of deaths and rebirths. As is well known, the course of this cycle is determined by *karma* – that is the (moral) consequences of the actions that the individual has accrued over his or her lifetime(s) – and the goal of every *jīva* is ultimately to break free of this cycle and to attain liberation (*mokṣa* or *mukti*) from suffering by divesting itself of all traces of attachment to, and conditioning by, the world of *prakṛti*, so allowing its *ātma* to realize its essential self as *puruṣa* (Chatterjee & Datta 2016 [1968], 15-16, 22, 283, 398-399; Dandekar 1962, 15-19). Now the belief that a single *jīva* lives multiple lives *seriatim* entails the existence of some principle of continuity that carries over from each life in the series into the others. This cannot be the gross body, which, at death, dissolves into the five elements of which it is constituted (Dandekar 1962, 9; Paul 1921, 151). The *ātma* and the subtle body, however, both survive death. As noted earlier, the *ātma* is, by its nature, eternal and changeless. The subtle body, on the other hand, is subject to change and is the carrier of *karma* – that is to say, it bears the moral consequences of a given *jīva*'s actions in the world: as such, it determines the kind of gross body that the *jīva* assumes in its next life (Dandekar 1962, 10). The subtle body of a *jīva* thus accompanies the *ātma* from one gross body to another over the course of the cycle of reincarnation, accruing and discharging the karmic burden in each lifetime until the goal of liberation is reached (Dandekar 1962, 10; Malhotra & Babaji 2020, 107; Paul 1921,151-152). Within the

Figure 3. The parts of a *jīva* in the cycle of death and rebirth (*saṃsāra*)
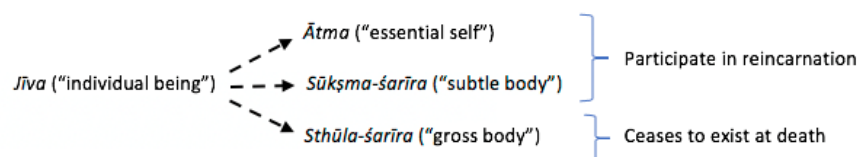
context of *saṃsāra*, then, the subtle body is closely associated with the *ātma*, serving as its interface to, and buffer from, the realm of *prakṛti* as the *ātma* undergoes rebirth and becomes an "embodied self" (*śarīra ātma*) (Dandekar 1962, 8-9; cf. Figure 3 above). The intimate connection between the *ātma* and the subtle body is reflected in the fact that the subtle body is considered to be a sign (*liṅga*) of the presence of the *ātma* in a physical body and is therefore sometimes called the *liṅga-śarīra,* or "indicatory body" (Dandekar 162, 9-10). The subtle body, then, occupies a singular position within the ontological structure of a *jīva*. On one hand, it shares with the gross body the property of belonging to the realm of *prakṛti*, while, on the other, it stands in close association to the *ātma* over the course of the cycle of death and rebirth undergone by the *jīva,* and serves, in effect, as the point of contact between the *ātma* and the phenomenal world.

Ranganathan's Ontology of the Book: A Second Glance and Further Developments

The traditional Hindu ontology of the *jīva* sketched out above served as a template for Ranganathan's ontology of the book. Most fundamentally, it provided Ranganathan with the three basic concepts – soul (i.e., *atma*), subtle body, and gross body – with which he analyzed the concept of "book" into its metaphysical parts. In adopting these concepts, Ranganathan retained their basic contours as found in tradition but often reshaped them in subtle ways to fit better the new context in which he was deploying them. For example, in a discussion of criteria for book selection in *LBS*, Ranganathan (1952a, 35; 2006 [1966], 89 [emphasis TMD]) writes:

> If the paper, the binding, and the print constitute the physical body of the book, the language, the style, and the illustration constitute its subtle body. The extent of choice in Book Selection from the point of view of the subtle body is greater than the one from the point of view of physical body.[15] *For the subtle body is a purely mental creation*. It is therefore more protein [sic, read "protean"—TMD] and capable of greater variation."

Here, the initially puzzling statement "the subtle body is a purely mental creation" becomes intelligible when one recalls that, in the traditional ontological model of the *jīva*, it is the subtle body that serves as the sphere of sensation, perception, cognition, and intellection—that is to say, the mental life of the empirical self. However, Ranganathan subtly transformed this idea by making the subtle body of a book a mental *creation* – something produced by the mind – rather than a mental faculty. Another creative adaptation of the traditional model occurs in a passage of *SEL* in which Ranganathan (1952c, 147) discusses the theme of "creation in literature". Having equated the *atma*, or soul, of a book with its thought-content and its subtle body with its linguistic expression, he asserts that "the expression and the thought are inseparable", attributing this statement to the classical Sanskrit poet Kalidasa,[16] and goes on to aver that "[t]his inseparable doublet is the creation of the author." Here, the inseparability of thought (= "soul") and expression (= "content") posited by Ranganathan is fully congruent with the inseparability of the *ātma* and subtle body in the cycle of death and rebirth that *jīvas* undergo. And, yet, Ranganathan departs from the traditional model in his claim that both the soul and subtle body of a book are the products of creation, for, as noted earlier, according to Sāṅkhya and Advaita Vedānta alike, the *ātma* of a *jīva* is eternal and uncreated. Ranganathan's use of the traditional model can thus be characterized as creative and pragmatic, retaining its basic structural features but altering it in details where doing so fit his purposes.

A fundamental area in which Ranganathan built upon, and yet subtly modified, the traditional ontology of the *jīva* was the relationships that he posited between the soul, the subtle body, and the gross body. According to Sāṅkhya, each living being comes into being through a complex process initiated by contact between *puruṣa* and *prakrti* that leads to a perturbation of the latter: this, in turn, leads to the formation of the component elements of the *sūkṣma-śarīra*, or subtle body, in a given sequence, and, ultimately, to the generation of the grosser elements from which the *sthula-śarīra,* or gross body, is produced (Chatterjee & Datta 2016 [1968], 266-273; 167).

---

[15] In the original 1952 edition of this book, a typesetting error led to the following self-contradictory statement: "The extent of choice in book selection from the point of view of physical body is greater than the one from the point of view of physical body." The 1966 edition corrected it to the form given in the main text above.

[16] In *LBS*, Ranganathan (1952a, 43; 2006 [1966], 94) identified the source of this statement as "the opening verse of the *Raghuvamsa*", one of Kalidasa's epic poems. The verse in question runs, in translation: "For better endowing / my word with meaning, / I first pay homage / to Parvati, the mountain born, / and Paramesvara, lord supreme, / the world's betters, / who are joined together / like word and meaning" (Kalidasa 2016, 3). Here "Paramesvara" is an epithet of the god Shiva and "Parvati", the name of Shiva's wife (cf. Johnson 2009, 232, s.v. Parameśvara & 234, s.v. Pārvatī). According to mythological tradition, Shiva and Parvati had a happy and lasting marriage, and it is to this permanent coupling that Kalidasa compares the indissoluble link between word and meaning, which Ranganathan transformed into the tight coupling of thought and expression. Interestingly, this verse appears to have been a favorite point of reference for Ranganathan in his teaching; see Kaula 1992, 129.

Advaita Vedānta posits a comparable course of development, albeit based on different ontological presuppositions and differing in its details (Dasgupta 1975, 73-77). At any rate, the process through which the *ātma* becomes an "embodied self" (Dandekar 1962, 9) proceeds in a "top-down" direction from the realm of the pre-existent pure spirit (*puruṣa* and *ātma*) through the formation of a relatively permanent subtle body to the generation of a relatively impermanent gross body. One result of this process is that the three metaphysical parts of a *jīva* stand in a hierarchical chain of relationships to one other, with the *ātma* standing in direct relationship to the subtle body and the subtle body, in turn, standing in direct relationship to the gross body. These relationships involve a complex set of dependencies among the *ātma*, the subtle body, and the gross body. For example, "the vital, mental, and intellectual functions implied by the [subtle body] become possible only on account of the presence and the direct awareness of the [*ātma*]" (p. 9), while, conversely, the subtle body serves as the *ātma*'s interface to the world. Similarly, "the gross body is the support of the subtle body in so far as the intellect (buddhi), the ego (ahaṅkāra), and the senses cannot function without some physical basis" (Chatterjee & Datta 2016 [1968], 272), while, on the other hand, the gross body requires the presence of a subtle body if it is to live.

In his ontology of the book, Ranganathan took over the hierarchical structure of the traditional ontology of the *jīva* as well as the underlying idea that immaterial entities can be embodied in physical objects. However, he rearticulated the specific relationships among the metaphysical parts of the book to match the bibliographic context of the model, formulating two different versions, one in *SB* and the other, in *SEL*. In the *SB* version, Ranganathan (Ranganathan 1952b, 22; 1974, 19) posited that a book communicates thought and that "the *subtle medium* through which the thought is communicated" is "the style, the clarity and the simplicity of the language and the aptness, expressiveness and revealing nature of the pictorial aids and diagrams". Thought and the "subtle medium" of language and illustrations, then, comprise, respectively, the soul and the subtle body of a book with the latter being "the subtle embodiment" of the former (1952b, 21; 1974, 18). On the other hand, the "physique" of the book serves as the material carrier "on which the subtle intangible medium is impressed and the thought is embodied" (1952b, p. 22; 1974, 19): that is to say, it constitutes the gross body of a book, which represents "the gross embodiment of ideas" (1952b, 21; 1974, 18). If one applies a rudimentary form of E-R analysis to these assertions, the following set of formal statements about relationships between the metaphysical parts of a book can be made:

1.1. [Soul = Thought]<is communicated by>[Subtle body = Language/Illustrations]

or: [Soul = Thought]<is subtly embodied in>[Subtle body = Language/Illustrations]

1.2. [Subtle body = Language/Illustrations]<is impressed upon >[Gross body = Physique]

1.3. [Soul = Thought]<is (grossly) embodied in>[Gross body = Physique].

These statements can be graphically expressed in the form of the E-R diagram in Figure 4 below. As this diagram reveals, Ranganathan envisaged two alternative ways of modelling a

Figure 4. Ranganathan's Ontology of the Book: *Social Bibliography (SB)* version
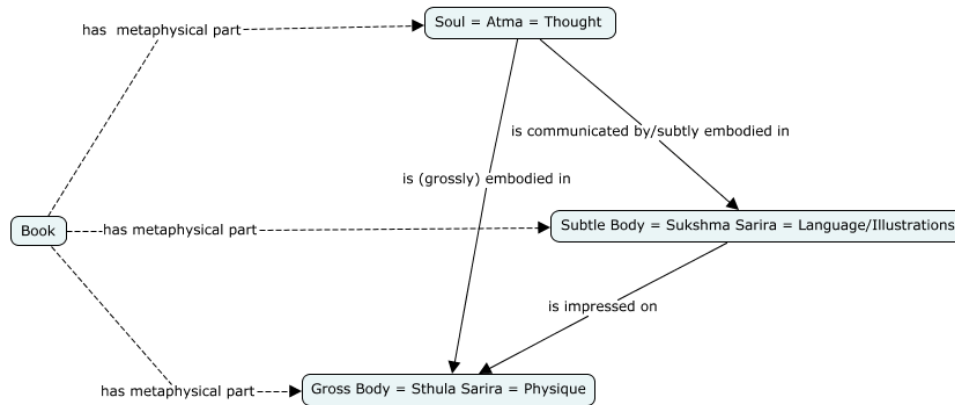
book in SEL. One posits a binary relationship in which the thought(-content), or soul, of the book is embodied in the physical pages of the book. The other posits a triadic relationship in which thought(-content) (= soul) is communicated by, or subtly embodied in, a linguistic/ artistic medium (= subtle body), which, in turn, is impressed upon, or grossly embodied in, the gross body of a book. Ranganathan's oscillation between a dyadic and a triadic model

here is, interestingly enough, reminiscent of Seymour Lubetzky's movement between a binary ("book" vs. "work") and trichotomic ("book" vs. "edition" vs. "work") account of the book in his writings (cf. nn. 2-3, above). Ranganathan apparently found both versions of the model good to think with, for, as we shall presently see, he would retain both alternatives in subsequent developments of the model.

In *SEL*, Ranganathan (1952b, 147) adumbrated a more integrated version of the alternative triadic and dyadic models, when he characterized the gross body – that is to say, "the physical book" – as "embodying expressed thought". If one unpacks this highly compressed formulation and transforms it into propositional form, one uncovers two assertions: first, that thought (= soul) is expressed – and from the context, it is clear that it is "the linguistic and pictorial vehicle of thought" (= subtle body) that serves as the means for expression – and, second, that the thought expressed by language or illustrations is embodied in a physical book (= gross body). If, again, one applies the formalisms of E-R analysis to these assertions, this yields the following three statements about the relationships among the three metaphysical parts of a book:

2.1. [Soul = Thought]<is expressed by>[Subtle body = Language/Illustrations]

2.2. [[Soul = Thought](and)[Subtle body = Language/Illustration]]<is>[Expressed thought]

2.3. [Expressed thought]<is embodied in>[Gross body = Physique]

Statement 2.2 is crucial here, for it represents an idea that we have already encountered – namely, Kalidasa's dictum that "the expression and the thought expressed are inseparable" (cf text at n. 16, above) – which Ranganathan explicitly cited in *SEL*. In conceptual model-

Figure 5. Ranganathan's Model of the Book: *Social Education Literature (SEL)* version
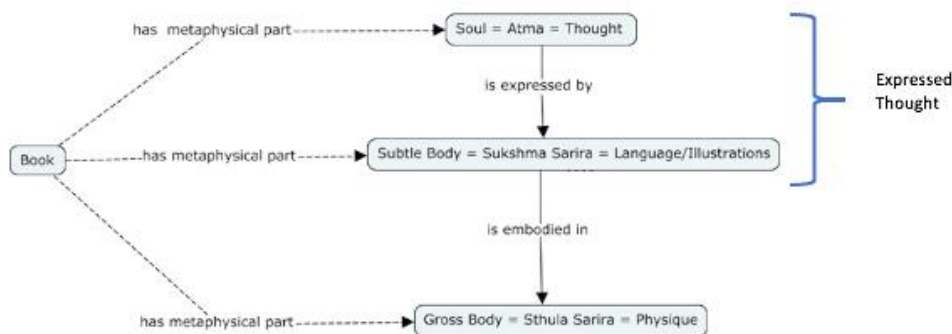
ling terms, this statement reifies the relationship given in Statement 2.1, collapsing it into a single entity, namely "expressed thought". If one keeps in mind, however, that the term "expressed thought" represents a relationship between thought (= soul) and its linguistic or pictorial expression (= subtle body) and that it is the later that is directly represented in a physical book (= gross body), one can represent the *SEL* version of Ranganathan's model graphically in Figure 5 above, where the reified entity "Expressed Thought" is expanded into the statement that it subsumes.

Significantly, Ranganathan continued to use the reified form of the model in other writings and, in fact, enshrined it in his terminology, though without any reference to the concepts of soul, subtle body, or gross body. In his important treatise on cataloging, *Heading and Canons: Comparative Study of Five Catalogue Codes* (hereafter, *HC*), which was published three years after *LBS*, *SB*, and *SEL*, he retained the distinction between "thought" and "expressed thought", defining the latter as "thought expressed in language or symbols or in any other mode and thereby made communicable" (Ranganathan 1955, 26). Then he went on to rename the concept of expressed thought as "work", noting that the latter term was "introduced for brevity". By the same token, Ranganathan defined "embodied thought" as a "[r]ecord of work on paper or other material, fit for physical handling, transport across space, and preservation through time" and renamed it as "document", again "for brevity" (p. 43). He further stipulated that "thought-content" as "[e]xpressed thought embodied within a docu-ment, or a volume of it," thus reinforcing the tendency to treat thought and its linguistic ex-pression as a single concept – "expressed thought". In distinguishing between the *work* (= "expressed thought") and *document* (= "embodied thought"), Ranganathan implicitly return-ed to a dyadic account of the book (see Figure 6 below), though now, in light of his growing

Figure 6. Ranganathan's Dyadic Model in *Heading and Canons* (HR)
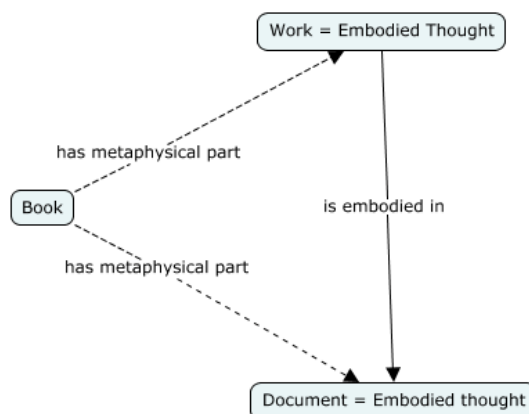
awareness of the documentation movement, he increasingly preferred to refer to biblio-graphic units as documents. This dyadic model of the book (or document) would continue to inform his later writings on cataloging (e.g., Ranganathan 2006 [1988], 117-118, 132-133).

Although Ranganathan dropped all allusions to soul, subtle body, and gross body in *HC* and his other works on cataloging, he did not abandon these concepts in other contexts. For example, in the second edition of his seminal *Prolegomena to Library Classification* (hereafter, *PLC*), which appeared in 1957, two years after the publication of *HC*, he amplified his standard definitions of terms pertaining to books with some remarks regarding the nature of books. In the course of these remarks, he asserted that "a book is a concrete entity embodying expressed knowledge-unit or auto-record of phenomenon" and that "a book is a material transform of immaterial knowledge-unit" (Ranganathan 1957, 346),[17] thus again presenting to his readers a dyadic conceptualization of books based on the distinction be-tween the materiality of the physical object and the immateriality of thought. However, Ranganathan immediately followed these statements with three parallel definitions of a book expressed in what he called an "equation of book":

Book (or document)
= Work + Body
= Thought + Subtle Body + Gross body; or Phenomenon + Subtle Body + Gross
Body
= Thought + Expression + Physique; or Phenomenon + Recording + Physique

---

[17] Two terms in these quotations may be confusing and require clarification here. First, the term "knowledge-unit" is a synonym for "thought" (Ranganathan 1955, 26; 1957, 343) and so the phrases "concrete entity embodying expressed knowledge-unit" and "material transform of immaterial knowledge-unit" can be read as "concrete entity embodying expressed thought" and "material transform of immaterial thought". Second, the term "auto-record of phenomenon" appears refer to a machine-generated record of a phenomenon that does not involve the mediation of language (and, hence, thought): an example might be a photograph of an aurora viewed in the heavens (cf. Ranganathan 2006 [1973], 29).

This set of definitions is striking for two reasons. First, it again reflects Ranganathan's tendency, under the influence of the documentation movement, to generalize his concept-ualization of bibliographic units from "books" to "documents", for, in addition to the standard physical book that, in his view, embodies thought, he makes room for records that capture data directly from phenomena viewed "in the wild" – such as photographs (cf. n. 16 below) – without the mediation of thought.[18] Second, and more importantly for our purposes, it presents Ranganathan's own interpretation of the relationship between the dyadic and triadic forms of his ontology of the book. The first of these equations defines the book as being composed of two elements, the "Work" – that is to say, expressed thought – and the "Body" – that is to say, the book as physical object. The second expands the first term in the equation – "Work" – into its two components – "Thought" (or "Phenomenon") and the "Subtle Body" through which thought is expressed or the phenomenon is recorded – while renaming the "body" as "Gross Body", thus transforming the dyadic model into a triadic one. The third equation simply renames the "Subtle Body" and "Gross Body" as "Expression" (for thought) or "Recording" (of phenomena) and "Physique", respectively, thus substituting generic terms for those derived from the traditional ontology of the *jīva*. For Ranganathan, then, the dyadic version of the model that he employed in his writings on cataloging could be readily transformed into the triadic version that he had introduced in *LBS*, *SB*, and *SEL*. Such a transformation justified, in his eyes, the use of the triadic model in contexts where it might be useful, such as the passage under review, in which the conceptual division of a book, or document, into "Thought" (or "Phenomenon"), "Expression" (or "Recording"), and "Phy-sique" served as a reminder that an ideal book classification should include such components as classes derived from "knowledge classification" (i.e., classes for subjects reflecting the content of thought or the existence of phenomena), means of indicating the form of expression or recording used in a document, and mechanisms for taking into account the physical features of books and other documents (p. 347).

In addition to invoking the triadic model of the book in his statement of the desiderata for a good bibliographic classification, Ranganathan also employed it in a discussion of one aspect of such an ideal classification -- the structure of call numbers. Within any given library collection, a call number is a classification-based notation assigned to a book or other document in order to individuate it from all other books held by the library and to indicate its position relative to other books or documents within the intellectual space that is defined by the classification being used and expressed in the physical arrangement of the contents of the library's shelves (cf. Ranganathan 2006 [1960], 1·3, §§ 01-011). According to Ranganathan, an ideal call number consists of three components – a *class number* that indicates the subject of which the book treats, a *book number* that "fix[es] its position relatively" to other books having the same class number, and a *collection number* that signals, if this is necessary, the specific (sub)collection with the Library to which the book belongs (pp. 1·3, § 012; 1·5, § 02; 1·9, §§ 03-030; 1·18, §§ 04-041). In the *PLC*, he sought to provide a theoretical rationale for this structure, in support of the proposition that a "right [i.e., correct—TMD] classi-fication" should make provisions for all three kinds of numbers (Ranganathan 1957, 385; 2006 [1989], 514). His argument opened with "a metaphysical analogy" and a "hypothesis" that directly invoked both

---

[18] Cf. the definition of "document" that Ranganathan (2006 [1973], 28) gave in a later work, *Documentation: Genesis and Development*: "A document is a graphic record of some *idea* or some *phenomenon*, made in words or in pictures" [emphases TMD]. On this view, a document either presents ideas – even ideas about phenomena – or direct representations of the phenomena themselves. Ranganathan's characterization of a document is a graphic record is also significant: as Buckland (1997), 806-807 has observed, unlike other documentalists, Ranganathan restricted "documents" exclusively to static physical materials on flat surfaces, such as the pages of a book, an offprint, a manuscript, a microform, or a photograph, while excluding such materials as audiovisual recordings.

the traditional model of the *jīva* and the doctrine of *saṃsāra*, and so are worth quoting *in extenso* (Ranganathan 1957, 384; 2006 [1989], 513):

> In certain systems of Indian Philosophy – and perhaps in others too, and certainly in theosophy – every living being is postulated to have three sheaths, viz. soul, subtle body and gross body. All these are separable. Soul can exist by itself; even then it is a being; there is the term, disembodied soul. A combination of soul and subtle body alone is postulated; this too is a being; the eschatology of many religions describe [sic] such a being. A combination of soul, subtle body, and gross body is a living being; this alone is commonly recognized as a living being; perhaps because this combination alone becomes manifest to the primary senses. The other two are cognizable only as an intellectual or intuitive experience.
>
> …
>
> The following hypothesis is common. A soul can get embodied in any number of subtle bodies in succession or even at the same time. A combination of soul and subtle body can get embodied in any number of gross bodies in succession or even at the same time. The *Bhagavad-gita*, for example, emphasizes this; The soul puts on and casts off bodies, even as we can put on and cast off clothes.[19] … .

Although much could be said about this interesting passage, two points are especially salient here. First, although Ranganathan asserted that the soul, the subtle body, and the gross body are all, in principle, separable from one another and so implied that they can be treated as distinct entities, he also drew certain limits to their separability. In his view, the individual soul is self-subsistent and can exist without either the subtle body or the gross body. It can also exist in combination with the subtle body, for, as Ranganathan pointed out in accordance with the traditional doctrine of *saṃsāra*, it is the tandem of soul and subtle body that undergo a series of rebirths in different gross bodies over the course of an individual's progress through the cycle of death and rebirth. Finally, when soul, subtle body, and gross body are combined, the result is a living being, whose physical form is the only aspect perceivable to other living beings in this world. The soul thus forms the core of the individual living being, or *jīva*, while the subtle and gross bodies are accretions that combine with the soul and allow the *jīva* to live and act in the physical world. By the same token, neither the subtle body nor the gross body can exist, either by itself or in tandem with the other body, without conjunction with the soul. In short, Ranganathan allowed only three combinations among the metaphysical parts of a *jīva*: soul; soul and subtle body; soul, subtle body, and gross body.

The second point of interest in this passage is Ranganathan's statements relating to the doctrine of *saṃsāra*. He averred that a given soul could be associated with multiple subtle bodies either *seriatim* or simultaneously and, similarly, that the combination of soul and subtle body could be incarnated in multiple gross bodies, again, either *seriatim* or simultaneously. Insofar as the cycle of birth and rebirth is generally perceived in Hinduism as involving movement of soul-*cum*-subtle body from a single body to another, one may well suspect that Ranganathan was taking creative license in his claims that a single soul may contract relationships with multiple subtle bodies at one time and that a soul-*cum*-subtle body could be embodied in more than one gross body at the same time.[20] However this may be, the upshot of these claims was that Ranganathan allowed for a one-to-many relationship between a soul and subtle body or between a soul-*cum*-subtle body and a gross body.

---

[19] See *Bhagavad Gita*, 2.22: "As a man leaves an old garment and puts on one that is new, the Spirit leaves his mortal body and then puts on one that is new" (Masceró 2003, 11).

[20] Belief in simultaneous multiple rebirth (i.e., the reincarnation of one soul into multiple bodies at the same time) is attested in Tibet, among the Inuit, and among some North American Indian tribes in the Pacific Northwest (McClelland 2010, 230, s.v. Rebirth, simultaneous). In Hinduism, by contrast, the default assumption is that a single soul, or *ātma*, will be reborn in a single body (cf., e.g., Bhagavad Gita, 2.22, quoted in n. 19 above), while some *darśanas*, such as Patañali Yoga, explicitly deny the possibility of multiple simultaneous reincarnation (cf., e.g., Larson 2018, 6).

After stating his "metaphysical analogy" and "hypothesis", Ranganathan (1957, 384; 2006 [1989], 513-514) again presented what he called an "equation of the document", in which he drew what are by now familiar equivalences between the metaphysical parts of a *jīva* and the metaphysical parts of a book:

Soul	= Thought-content
Subtle body	= Language or other medium, and form of exposition
Soul + Subtle body	= Work
Gross body	= Material in which work is embodied
Soul + Subtle body + Gross body	= Document

The sequence of these equivalences is structured in such a way that it builds up the tripartite concept of document from its component parts, following the order of the exposition of the analogy: beginning with the soul, or thought-content of a document and the subtle body, or medium of expression, it proceeds to their combination in the concept of the work, and after adding the gross body, or the material object in which the work is embodied, it closes with a characterization of a document as the conjunction of thought-content and the linguistic or other form of expression, which together constitute a work, and the physical carrier in which the work is embodied. This provided the basis for Ranganathan's argument that the call number of a book should allow for the indication of all three components of the document: a class number for its soul, or thought-content; a book number for its subtle body, or medium of expression; and a collection number for its gross body, or physical carrier (Ranganathan 1957, 385; 2006 [1989], 514; cf. 1953, 12-13). As in the case of the "equation of book" discussed earlier, it is apparent that Ranganathan's development of the equation incorporated elements of both a dyadic (i.e., "Work" and "Document") and a triadic (i.e., "Soul" [= Thought-content], "Subtle body" [= Medium of expression], "Gross body" [= Physical carrier]) model of the book. Here again, Ranganathan's use of the triadic rather than the dyadic version of the model was conditioned by a pragmatic consideration—his wish to make the case for a tripartite call-number, each element of which would be indexed to one of the three metaphysical parts of a book, or document.

Ranganathan's Ontology of the Book Compared to Contemporary Bibliographic Conceptual Models.

Even a cursory consideration of the material presented in Sections 2 and 4 above reveals that Ranganathan's ontology of the book, which he derived from the traditional Hindu ontology of the *jīva*, exhibits a number of features of E-R analysis. We have seen that Ranganathan posited three *entities* – the soul (= thought-content), the subtle body (= mode of expression), and the gross body (= physical carrier) – as metaphysical parts of a book and established *relationships* among them, so much so that they can easily be reduced to E-R diagrams, such as those given in Figures 3-6. We have also seen that, through a process akin to reification, Ranganathan developed a dyadic version of the triadic model that he had originally postulated: he did so by collapsing the relationship between the soul (= thought-content) and subtle body (= mode of expression) into a single entity, which he called a "work", and by redefining the gross body as a document, so that the tripartite relationship between soul, subtle body, and gross body (cf. Figures 4 & 5 above) was converted into a bipartite one between work and document alone (cf. Figure 6 above). In most of the works in which Ranganathan discussed his model, he paid less attention to the *attributes* of the bibliographic entities that he posited, though he did enumerate some of their properties in *LBS* (cf. Section 2 above). In short, although Ranganathan did not employ any of the formalisms of E-R modelling in elaborating or presenting his model of the book, it is evident that this informal model adumbrated many of the features of E-R analysis.

For this reason, we are justified in considering Ranganathan's ontology of the book, in both of its versions, to be an example of a bibliographic conceptual model *avant la lettre* (see Section 1 above). This naturally raises the question of how this model compares to the leading conceptual models used in bibliographic description today, IFLA-LRM (with its predecessor FRBR) and BIBFRAME.

**Ranganathan's Model and the FRBR/IFLA-LRM Model compared**
We begin by comparing Ranganathan's ontology of the book to FRBR and IFLA-LRM. As is well known, IFLA-LRM is a development from, and refinement of, FRBR and thus differs from it in a number of respects (Bianchini 2017; Riva 2016). However, IFLA-LRM also preserves many of the features of FRBR, including those that are of greatest interest to us here, the set of bibliographic entities, known as Group 1 Entities, and their relationships (Bianchini 2017, 90). To be sure, IFLA-LRM has introduced some changes here as well: most notably, it "reworks some of the definitions [of bibliographic entities—TMD] without modifying the[ir] roles and essential meanings" (Riva 2016, 270; cf. Bianchini 2017, 90). It will thus be useful to review briefly the bibliographic entities of FRBR and IFLA-LRM and the relationships that obtain between them.

FRBR and IFLA-LRM stipulate the existence of four bibliographic entities: Work, Expression, Manifestation, and Item. A *Work* is defined in FRBR as "a distinct intellectual or artistic creation" (IFLA Study Group on the Functional Requirements for Bibliographic Records 1998, 16) while IFLA-LRM adjusts the formulation to "the intellectual or artistic content of a distinct creation" (Riva, Le Boeuf, & Žumer 2017, 21), noting that "[t]he essence of the *work* is the constellation of concepts and ideas that form the shared content of what we define to be *expressions* of the same *work*". An *Expression*, according to FRBR, is "the intellectual or artistic realization of a *work* in the form of alpha-numeric, musical, or choreographic notation, sound, image, object, movement, etc., or any combination of such forms" or, more succinctly, "the specific intellectual or artistic form that a *work* takes when it is realized" (IFLA Study Group on the Functional Requirements for Bibliographic Records 1998, 18). IFLA-LRM, on the other hand, defines *Expression* compactly as "distinct com-bination of signs conveying intellectual or artistic content", with the rider that "the term "sign" is intended … in the meaning used in semiotics" (Riva, Le Boeuf, & Žumer 2017, 23). As for *Manifestation*, FRBR takes it to be "the physical embodiment of an expression of a work" (IFLA Study Group on the Functional Requirements for Bibliographic Records 1998, 20), while IFLA-LRM recasts the definition to read "a set of all carriers that are assumed to share the same characteristics as to intellectual or artistic content and aspects of physical form", with the stipulation that "[t]hat set is defined by both the overall content and the production plan for its carrier or carriers" (Riva, Le Boeuf, & Žumer 2017, 23). The fourth and final entity is the *Item*, which FRBR regards as "a single exemplar of a *manifestation*" (IFLA Study Group on the Functional Requirements for Bibliographic Records 1998, 23), while IFLA-LRM defines it as "[a]n object or objects carrying signs intended to convey intellectual or artistic content" (Riva, Le Boeuf, & Žumer 2017, 27). Both models agree as to the primary relationships obtaining between these four entities (IFLA Study Group on the Functional Requirements for Bibliographic Records 1998, 13; Riva, Le Boeuf, & Žumer 2017, 65-66):

3.1. [Work]<is realized through>[Expression]

3.2. [Expression]<is embodied in>[Manifestation]

3.3. [Manifestation]<is exemplified by>[Item].

These are represented in graphic form in Figure 7 below. These relationships, it should be noted, are governed by cardinality constraints that are common to both FRBR and IFLA-

Figure 7. Bibliographic Entities and Relationships in FRBR/IFLA-LRM
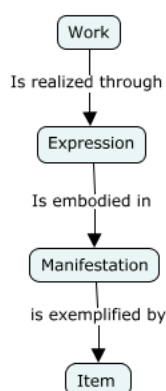
LRM. In both models, a work stands in a one-to-many relationship to the expressions in which it is realized, while each expression can realize only one work; expressions and manifestations stand in a many-to-many relationship with each other – that is to say, each expression can be embodied in one or more manifestations and each manifestation can embody one or more expressions; and a manifestation stands in a one-to-many relationship to the items exemplifying it, whereas each item can exemplify only one manifestation (IFLA Study Group on the Functional Requirements for Bibliographic Records 1998, 84; Riva, Le Boeuf, & Žumer 2017, 65-66).

Previous commentators have already identified correspondences between the entities of Ranganathan's ontology of the book and the FRBR/IFLA-LRM model (Bianchini 2015, 166-167; Vargese 2008, 286-287) that are worth recalling here. The soul of a book, which, according to Ranganathan (1952b, 23; 1952c, 147; 1974, 19), constituted its "thought-content" or "idea-content", clearly stands in close analogy to the FRBR/IFLA-LRM Work, especially if one adopts IFLA-LRM's version of the definition of this entity as "the intellectual or artistic content of a creation" (Riva, Le Boeuf, & Žumer 2017, 21). Similarly, Ranganathan's description of the subtle body as the "linguistic medium" (1952b, 23) or "the linguistic or pictorial vehicle of thought" (1952c, 147) used in a book aligns closely with the FRBR/IFLA-LRM Expression, which likewise includes linguistic and pictorial sign systems among the defining features of this entity. Finally, Ranganathan's characterization of the gross body (1952a, 22-35; 2006 [1966], 78-88) as the "physique" – that is to say, the physical form – of a book corresponds almost exactly to the FRBR definition of the Manifestation as "the physical embodiment of an expression of a work" (IFLA Study Group on the Functional Requirements for Bibliographic Records 1998, 20) in taking physicality as the defining feature of the entity.[21] To be sure, the

---

[21] IFLA-LRM's definition of the Manifestation, by contrast, contains elements that move it significantly away from the relatively straightforward definition of FRBR and, *a fortiori*, from Ranganathan's notion of gross body. The stipulation that a Manifestation consists of the "set of all carriers that are assumed to share the same characteristics as to intellectual or artistic content and aspects of physical form" and that this set "is defined by both the overall content and the production plan for its carrier or carriers" (Riva, Le Boeuf, & Žumer 2017, 23) incorporates the ideas that a Manifestation is a set of items and that the intended process of production plays a crucial role in defining this

definitions in Ranganathan's and FRBR/IFLA-LRM's models cannot be considered to be exact equivalents. Ranganathan's model is based on "bibliocentric" assumptions in that he took the traditional codex book as the archetypal library resource *par excellence* and all other documentary materials as deviations from this norm, [22] whereas the original framers of FRBR/IFLA-LRM quite consciously sought to be "comprehensive in terms of the variety of materials" that could be accommodated under their model (pp. 7-8). A consequence of this is that the FRBR/IFLA-LRM model's definitions are more capacious than those of Ranganathan's: for example, his characterization of the subtle body focuses almost entirely on the linguistic and illustrative expression of intellectual content, while the FRBR model's definition of Expression enumerates a long list of sign systems for representing different kinds of works, including musical and moving-image works, and the IFLA-LRM definition generalizes this into the statement that any "distinct system of signs convening intellectual or artistic content" (Riva, Le Boeuf, & Žumer 2017, 23) qualifies as an Expression. Yet, even if one takes such differences into account, it is apparent that there is, at the very least, a "certain correspondence" (Bianchini 2015, 167) between Ranganathan's soul, subtle body, and gross body, and FRBR/IFLA-LRM's Work, Expression, and Manifestation (See Figure 8 below).

When we turn to the relationships among bibliographic entities, it is also possible to observe some parallels between the models. As we have seen, in *SB*, Ranganathan considered the soul of a book "to be communicated by" or "subtly embodied in" its subtle body, while, in *SEL*, the characterization varied, with the soul being "expressed by" the subtle body (see Statements 1.1 & 1.2, above): by contrast, FRBR/IFLA-LRM stipulates that a Work "is realized through" an Expression (see Statement 3.1 above) without specifying further what such realization might mean.[23] Of the three different characterizations of this relationship that Ranganathan gave in his writings, that of expression in *SEL* perhaps comes closest to that of

---

set. Such notions go well beyond the idea of physical embodiment present in FRBR's definition of Manifestation and of Ranganathan's characterization of the subtle body as physique *tout court*.

[22] One telling indication of Ranganathan's bibliocentrism is his characterization of the bringing together of materials in non-traditional formats – "Film role; Film strip; Microcard; Transparent card; Ceiling book; Gramophone record; Speaking book; and Braille book" – to form subcollections within a library's holdings as "collection by unusual gross body" (Ranganathan 1957, 379).

[23] Note especially the definition of the relationship "is realized through" given in IFLA-LRM: "This relationship links a work with an of the expressions which convey the same intellectual or artistic content" (Riva, Le Boeuf, & Žumer 2017, 23). This certainly indicates the *function* of the relationship but reveals little about the (Fregean) *sense* of the relationship.

Figure 8. Comparison of Ranganathan's and FRBR/IFLA-LRM Models
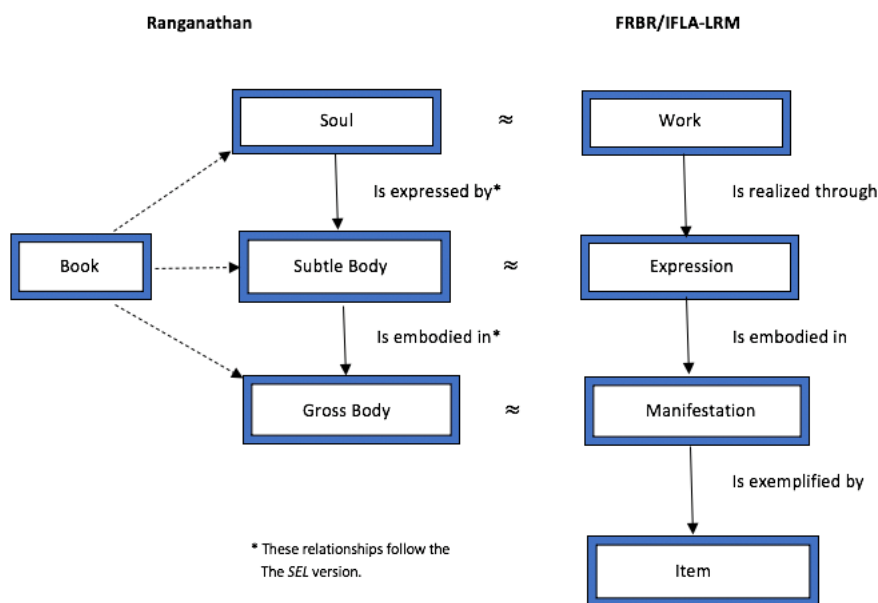
IFLA-LRM's rather abstract notion of realization: at any rate, it is worth noting that one of the terms that he chose to denote the relationship between soul and subtle body is etymologically cognate to IFLA-LRM's analogue to the subtle body. Ranganathan also gave different names to the relationship between the subtle body and the gross body, stating in *SB* that the subtle body "is impressed upon" or "grossly embodied in" the gross body (see Statement 1.2 above), while, in *SEL*, he stated that reified entity soul-*cum*-subtle body "is embodied in" the gross body (see Statements 2.2 & 2.3, above). The language of embodiment here forms a direct parallel with that of the relationship stipulated by IFLA-LRM between Expression and Manifestation (see Statement 3.2, above), though, because of the differences between FRBR's and IFLA-LRM's definitions of Manifestation, FRBR's version of the relationship is closer in meaning to Ranganathan's relationship of embodiment than IFLA-LRM's is.

Two other points of comparison between the relationship structures of Ranganathan's and IFLA-LRM's models are those of their directionality and cardinality. As regards the former, we have seen that Ranganathan's ontology of the book followed the traditional Hindu ontology of the *jīva*, which posits a top-down approach that begins with the existence of an eternal and unchanging *ātma* (= "soul"), which then becomes associated with a *sūkṣma-śarīra* (= subtle body), with the combined *ātma-cum-sūkṣma-śarīra* finally incarnating in the *sthūla-śarīra* (= gross body) to form a living being (cf. Section 4 above). In bibliographic terms, this meant that in the act of creation, the thought-content (= soul) and linguistic or artistic expression (= subtle body) of a book – which, as noted earlier, Ranganathan (1952c, 147) considered to be "inseparable" even if the latter depends upon the former for its existence –are ontologically and temporally prior to its physical form. Nevertheless, a book or document exists only when all three metaphysical parts are present (Ranganathan 1957, 346, 384), and only the gross body of the physical book is directly perceivable to the senses (p. 346): in this everyday sense, the physical form of the book is epistemologically prior to its more immaterial components. Given

this tension between the ontological and epistemological perspectives, it is revealing that, in his writings, Ranganathan discussed the metaphysical parts of a book in both a top-down and a bottom-up manner. In *SEL*, where he was discussing literary creation, and in *SB*, he presented the "trinity" of the book in the top-down sequence of soul, or thought content; subtle body, or mode of expression; and gross body, or physical form. In *LBS*, on the other hand, which dealt with the principles of book selection, he inverted the order of exposition, beginning with the gross body, then proceeding to the subtle body, and concluding with the soul of the book (Ranganathan 1952a, 101-102; 2006 [1966], 77-78). In short, despite his own theoretical presuppositions, which favored a top-down approach to the ontology of the book, Ranganathan countenanced both top-down and bottom-up views of his model.

As regards directionality, FRBR presents its entities and the relationships between them in a sequence that begins with the Work, proceeds to the Expression, continues to the Manifestation, and ends with the Item; it thus goes in a top-down direction from the most abstract entity to the most concrete (Coyle 2016, 86). However, it remains agnostic as to the temporal significance of this order and does not present any explicit theory of creation to justify it:[24] thus one could, in principle, begin with the most concrete of the entities, the item, and work up the scale of abstraction to the work (pp. 86, 94, with Figure 7.2). FRBR's implicit preference for a top-down presentation of the model and its apparent tolerance of a bottom-up view render it broadly similar to Ranganathan's approach, which likewise preferred a top-to-bottom approach but was also willing to reverse the order if necessary. IFLA-LRM follows FRBR in presenting the four entities of Work, Expression, Manifest-ation, and Item in a top-down order. However, it also specifies that "[a]n *expression* comes into existence simultaneously with the creation of its first *manifestation*, no *expression* can exist without there being (or there having been at some point in the past) at least one *manifestation*" and that "[a] *work* comes into existence simultaneously with the creation of its first *expression*, no work can exist without there being (or there having been at some point in the past) at least one *expression* of the *work*" (Riva, Le Boeuf, & Žumer 2017, 21, 23). These statements constitute a rudimentary theory of creation that states clearly the conditions under which a bibliographic resource can be said to come into existence: the intellectual or artistic content *must* be realized by a sign system of some sort, and this sign system *must* be embodied in a manifestation.[25] IFLA-LRM thus posits a mutual ontological dependence among the Work, the Expression, and the Manifestation. It is not difficult to discern some points of analogy with Ranganathan's thought here: for example, the claim that "[a] work comes into existence simultaneously with the creation of its first expression" is strongly reminiscent of his favored *dictum* from Kalidasa that "[l]anguage and thought are inseparably fused" (1952a, 43; Ranganathan 2006 [1966], 94). Ranganathan did not make similar statements about the necessity of the relationship between expressed thought and its physical carrier, though, as we have seen, he did consider the physical carrier to be a necessary precondition for a document to exist.

Finally, we come to cardinality. As noted earlier, FRBR and IFLA-LRM share a fully-developed system of cardinality constraints in the relationship structure linking their bibliographic entities: a Work may be realized by multiple Expressions, though any Expression

---

[24] Cf. Coyle 2016, 86: "… FRBR does not describe the process of creation, but rather a fully realized resource. There is no temporal order implied between the entities of Group 1."

[25] These conditions for creation make explicit the important point that a material carrier on which an expression can be embodied is a *sine qua non* for a work to qualify as a bibliographic resource. They forestall the possibility of a bibliographic Platonism that would allow for the existence of disembodied (and maybe even unexpressed) works or expressions, much as Ranganathan (1957, 384) envisioned the existence of disembodied souls and souls-*cum*-subtle bodies in his "metaphysical analogy" to the book or document.

can only realize a single work; Expressions may be embodied in multiple Manifestations, while a Manifestation can embody multiple Expressions; and a single Mani-festation can be exemplified by multiple Items, whereas a single Item can exemplify only one Manifestation. Ranganathan, by contrast, did not formally a develop a set of such constraints in his writings: indeed, in the *BSE*, *SB*, and *SEL*, he did not even consider the issue. However, in the "metaphysical analogy" that he set forth in the *PLE*, he advanced the hypothesis that a soul could be embodied in multiple subtle bodies at once and that the composite soul-*cum*-subtle body could, in turn, be embodied in multiple gross bodies (Ranganathan 1957, 384). Such a hypothesis implies that, in the bibliographic sphere, the identical thought-content (= soul) could be distributed across multiple expressions of content (= subtle bodies) and that, in turn this expressed thought could be embodied in multiple physical carriers (= gross bodies). This, of course, is analogous to the FRBR/IFLA-LRM stipulations that a Work can be realized by multiple Expressions and that an Expression can be embodied in multiple Manifestations. Although Ranganathan does not appear to have developed the thought further, it would appear that, at the very least, he glimpsed the possibility of embedding one-to-many relationships, albeit exclusively in a top-down direction, in the relationship structure of his ontology of the book.

**Ranganathan's Model and the BIBFRAME Model Compared**
Thus far, we have seen that the triadic version of Ranganathan's ontology of the book is comparable to the FRBR/IFLA-LRM models in several respects: the entities of the former – the soul, subtle body, and gross body of a book – generally correspond to the Work, Ex-pression, and Manifestation entities in the latter and there are some interesting points of con-vergence in the respective networks of relationships of these two models, most notably in their sharing of the idea of "embodiment". At first blush, the analogies between Ranganathan's model and FRBR/IFLA-LRM might lead one to the conclusion that the former must be quite dissimilar from the BIBFRAME bibliographic conceptual model, for the latter exhibits some substantive differences from the former. The most noticeable difference concerns the number of bibliographic entities in the model: whereas FRBR/IFLA-LRM has four entities, BIBFRAME only admits three: The *bf:Work*, which "reflects the conceptual essence of the cataloged resource" and covers such attributes as the subject of

Figure 9. Bibliographic Entities and Relationships in BIBFRAME

bf:Work

has Instance

bf:Instance

has Item
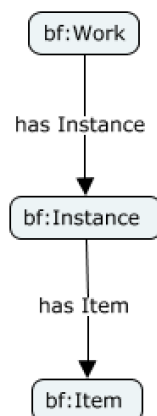
bf:Item

which a resource treats and the language in which it is written; the *bf:Instance*, which represents an "individual, material embodiment[]" of a bf:Work; and the *bf:Item*, "an actual copy" of a bf:Instance (Library of Congress, 2016; cf. Figure 9 above). It is generally agreed that the bf:Item is equivalent to the FRBR/IFLA-LRM Item and that bf:Instance stands in close analogy to the FRBR/IFLA-LRM Manifestation (e.g., Hahn & Dousa, 2020, 1; Seikel & Steele 2020, 65). However, despite their similarity in name, bf:Work does not stand in a one-to-one correspondence with the FRBR/IFLA-LRM Work, for it also includes attributes that are characteristic of the FRBR-LRM Expression, of which the most salient here is that of language (Seikel & Steele 2020, 65). Another feature of BIBFRAME that, at least su- perficially, distinguishes it from FRBR/IFLA-LRM is the relative semantic colorlessness of the primary relationships among its entities. Whereas a FRBR/IFLA-LRM Work "is realized through" an Expression; an Expression "is embodied in" a Manifestation; and a Manifestation "is exemplified by" an Item, a bf:Work simply "has (an) instance" and a bf:Instance "has (an) item" (Library of Congress 2016): otherwise, BIBFRAME maintains a discreet silence as to the ontological import of the relationships that bind its entities to one another.

Figure 10. Comparison of Ranganathan's Dyadic Model and BiBFRAME
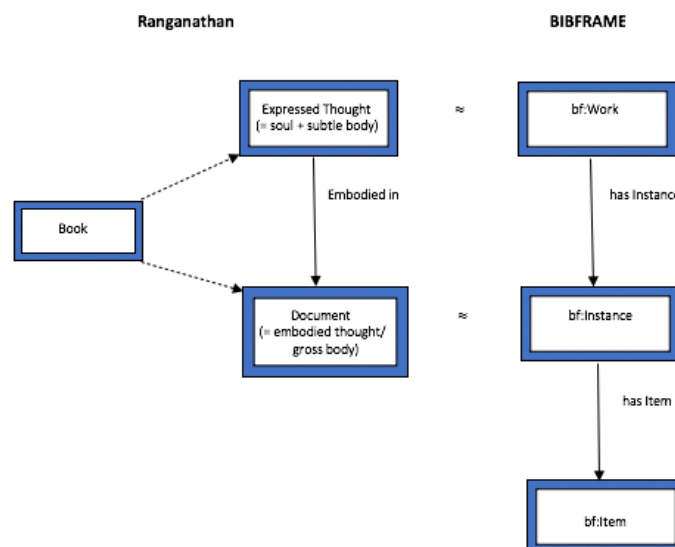
In the foregoing respects, BIBFRAME differs from the triadic version of Ranganathan's ontology of the book, which distinguished between the conceptual and the linguistic aspects of a bibliographic resource, representing the former as the soul and the latter as the subtle body of a book, and deployed semantically robust relationships – such as those of "communication", "expression", "embodiment", and "impression" (cf. Figures 4 & 5 above) – to relate the metaphysical parts of a book to one another. However, when we turn to the dyadic version of Ranganathan's model, it is quite comparable to BIBFRAME. As has already been noted several times above, Ranganathan (1952a, 43; 1952c, 147; 2006 [1966], 94) followed Kalidasa in positing that thought and language are inextricably intertwined with one another. This tenet led him to collapse the relationship between the soul (= thought) and subtle body (= mode of expression) of a book into a single, reified entity – "expressed thought" – to which he gave the name of "work" (cf. Statement 2.2 above, with Ranganathan 1957, 343). Insofar as Ranganathan's work entity represents both the conceptual and linguistic aspects of a book, it aligns perfectly with the bf:Work. Moreover, Ranganathan's characterization of the physical carrier of a work as a document representing its "embodied thought" (p. 344-345) corresponds to BIBFRAME's description of bf:Instance as a "material embodiment[]" (Library of Congress 2016) of a bf:Work. At these points, at least, the dyadic version of Ranganathan's ontology of the book is quite analogous to BIBFRAME (see Figure 10, above).

Differences: Items and Metaphysical Parts
Thus far, we have highlighted points of correspondence between the two versions of Ranganathan's ontology of the book, on the one hand, and the FRBR/IFLA-LRM and BIBFRAME bibliographic conceptual models, on the other. However, even a casual perusal of Figures 8 & 10 reveals two major differences between Ranganathan's and these latter-day models. First, both versions of Ranganathan's model lack a parallel to FRBR/IFLA-LRM's and

BIBFRAME's Item entity. Second, Ranganathan's model treats its entities – soul, subtle body, and gross body (or work and document) – as metaphysical parts of a larger biblio-graphic whole – the book. By contrast, FRBR/IFLA-LRM and BIBFRAME, although they concatenate their entities to one another in a series of relationships, do not formally relate them to a larger "super-entity" of which those entities would form parts: rather, they treat them as independent entities (Park, Brenza, & Richards 2020, 9; cf. Baker, Coyle, & Petiya 2014, 578).[26] At first sight, it might seem tempting to resolve these differences by viewing the "book" entity in Ranganathan's model as an analogue to the Item and bf:Item entities of FRBR/IFLA-LRM. In the case of FRBR, such an interpretation is possible if one adopts a "bottom-up" reading of the relationship structure among the bibliographic entities and assents to the statement that "[c]onceptually, an item is a concrete example of a manifestation that embodies the expression of a work" (Coyle 2016, 94). On this view, "when you hold [an] item in your hand, you are holding something that has within it an entire Group 1" (p. 94, with Figure 7.2, right side): that is to say, an Item contains within itself the Work, Expression, and Manifestation, much as, for Ranganathan, a book contains within itself a soul, a subtle body, and a gross body. Attractive as this proposal is, it founders on the ground that the two models embed the Item and the book in very different relational structures: a FRBR Item stands in a direct relationship only to the Manifestation and its relationship to the Expression and Work is thus only through the Manifestation (see Figure 7, above), whereas Ranga-nathan's book stands directly in a partitive relation to each of its three component parts (see Section 2, esp. Figure 1). As for BIBFRAME, it considers bf:Work, bf:Instance, and bf:Item to be different "levels of abstraction" for describing a bibliographic resource (cf. n. 26, above). An entity that functions as a level of abstraction for describing a resource cannot be identical to that resource as a whole. There can thus be no question of transposing the bf:Item to a position akin to that of Ranganathan's book, for, *by definition*, the former represents only one aspect – or metaphysical part, if you will – of a resource, whereas the latter constitutes a whole. In sum, the lack of an "item-like" entity in Ranganathan's model and the absence of a "book-like" super-entity in both FRBR/IFLA-LRM and BIBFRAME constitute unbridge-able structural differences between Ranganathan's bibliographic conceptual model *avant la lettre* and the contemporary bibliographic conceptual models.

Given that Ranganathan's ontology of the book otherwise has striking structural affinities with both FRBR/IFLA-LRM and BIBFRAME, one may well wonder why they diverge at these particular points. I suggest that the explanation is to be sought in the different purposes for which these models were designed. As the expanded form of its name implies, FRBR is concerned with the **f**unctional **r**equirements for **b**ibliographic **r**ecords and one of the primary

---

[26] This is not to say that the contemporary bibliographic models neglect entirely the potential for viewing their bibliographic entities as parts of a higher unity. The framers of FRBR, for example, brought them together under the rubric of "Group 1 Entities", noting that "[t]he entities in the first group … represent the different aspects of user interests in the products of intellectual or artistic endeavour" (IFLA Study Group on the Functional Requirements for Bibliographic Records 1998, 12). In stating that these entities form "aspects" defined by users' interests in the "products of intellectual or artistic endeavor", they implied that such "products", in fact, form "a complex entity that combines meaning, expression, and physicality" (Coyle 2015, 271-272) – that is to say, in our terminology, that Work, Expression, Manifestation, and Items are metaphysical parts of a more comprehensive unity. BIBFRAME likewise implies the presence of a higher bibliographic unity when it acknowledges that information about a given "resource" is organized into "core levels of abstraction", constituting the bf:Work, bf:Instance, and bf:Item (Library of Congress, 2016): on this view, bf:Work, bf:Instance, and bf:Item can be said to be metaphysical parts of a resource being cataloged. IFLA-LRM, on the other hand, has abandoned the concept of "Group 1 Entities" and, in doing so, has effaced any implicit notion of a more comprehensive entity. Although FRBR and BIBFRAME imply that the bibliographic entities in their models can be treated as metaphysical parts of a more comprehensive bibliographic entity, they have not formally defined such an entity in their respective models.

objectives motivating its framers was "to provide a clearly defined, structured framework for relating the data that are recorded in bibliographic records to the needs of the users of those records" (IFLA Study Group on the Functional Requirements for Bibliographic Records 1998, 18). *Mutatis mutandis*, IFLA-LRM has adopted this goal, seeking "to make explicit general principles governing the use of bibliographic information" (Riva, Le Boeuf, & Žumer 2017, 9). In a similar vein, BIBFRAME describes itself as "an initiative to evolve bibliographic description standards to a linked data model, in order to make bibliographic information more useful both within and outside the library community" (Library of Congress 2016). As these statements of purpose indicate, all three conceptual models take as their focal point bibliographic descriptions – i.e., "bibliographic records" or "bibliographic information" – and the data contained therein. The creators of FRBR, IFLA-LRM, and BIBFRAME have thus viewed the design of their bibliographic entities through the prism of the bibliographic records describing them and it is from this perspective that decisions about the modelling of these entities have been made.

By contrast, Ranganathan did not formulate his ontology of the book with the intent to create a framework for the evaluation and design of bibliographical descriptions. Rather, it appears that his account of the book as consisting of a soul, a subtle body, and a gross body was originally pedagogical in nature, serving as a means of explaining the tripartite form of the ideal class number to students of library science (Ranganathan 1948, 305, 307). As we have seen, Ranganathan would expand on this theme in the second edition of *PLC* (see above, Section 4). However, this schema proved to be useful in a number of other contexts as well. In *LBS*, Ranganathan used it to structure his discussion of the principles of book selection by considering in turn factors relating to the evaluation of the physical form, the means of expression, and thought-content, respectively.[27] In *SB*, on the other hand, Ranganathan (1952b, 23-24, 27; 1974, 21, 26) employed the model as a framing device for distinguishing between different kinds of bibliography, beginning with subject bibliography, which he characterized as being bibliography "dominantly associated with the soul of books" and then proceeding to the primary focus of interest, bibliography "concerned only with the gross body or physique of the book", which he called "physical bibliography". In *SEL*, the model again appeared as a means of structuring the various stages in the creation of books, from the creative work of the author through the production of the physical form (Ranganathan 1952c, 147, 194). Ranganathan thus appears to have used his model of the book as a structural framework for framing discussions of different aspects of the book in various contexts, though notably, as already mentioned, he did not deploy the schema in his writings on cataloging.

Ranganathan evidently employed his ontology of the book for different ends than the designers of FRBR/IFLA-LRM and BIBFRAME envisioned for their models and it is this difference in context of use that explains the divergences in structure we have noted above. For

---

[27] Cf. the clear statement of methodology at Ranganathan 1952a, 21-22; 2006 [1966], 77: "When we look at the … word 'Book', the First Law would employ the well-known rule of *Panchatantra*—divide and rule. It will ask us to recognise the composite nature of a book. Indeed it would bring back to our mind that a book is a trinity. It is a trinity of the gross body (= the physique), the binding, the papers and the print, the subtle body (= the language the style and the standard of exposition) and the soul (= the thought-content or the subject matter of the book. The First Law would first break down the idea 'Book' into these three sub-ideas. It will then pursue this breaking down process still further in each case until the principles of selection appear on the surface." Two references here require elucidation. "The First Law" here refers to Ranganathan's First Law of Library Science ("Books are for use") and appears in this context because Ranganathan structured *LBS* in accordance with his Five Laws (cf. Ranganathan 1952, contents page). As for *Panchatantra*, this is the name of a famous Sanskrit collection of folk stories and fables on political themes on animal themes in five divisions, or books. Ranganathan's allusion to the maxim "Divide and rule" appears to refer to the first of these books, which is entitled "On Causing Dissension Among Allies" (Olivelle, 1999, x, 5).

one thing, the notion of an item – that is to say, an individual copy of a book or other resource – is of obvious importance for a conceptual model relating to bibliographic records, since one of the functions of such records is to support the tracking of individual copies (cf. Svenonius 1992, 4): it is thus unsurprising that FRBR/IFLA-LRM and BIBFRAME include Item and bf:Item, respectively, in their inventories of bibliographic entities. On the other hand, Ranganathan made use of his model primarily in contexts that did not require consideration of individual copies of documents; it is presumably for this reason that he did not incorporate an item-like entity within his model. However, Ranganathan did utilize his ontology of the book in contexts where his aim was to decompose a master concept – be it "book" (in *LBS*), "bibliography" (in *SB*), or "the process of creating books" (in *SEL*) – into smaller, more tractable parts. For this purpose, a model featuring the analysis of a whole into its components was obviously a desideratum that Ranganathan fulfilled by developing his notion of a book as a "trinity" consisting of three metaphysical parts. The framers of FRBR/IFLA-LRM and BIBFRAME, on the other hand, appear to have been concerned primarily with capturing different "aspects" (FRBR) or "levels of abstraction" (BIBFRAME) of bibliographic resources as refracted through the prism of bibliographic descriptions (cf. n 26, above) and so formally identified only the parts, but not the whole, as bibliographic entities within their models. In sum, differences in purpose and context of use appear to provide the explanation for the structural divergencies between Ranganathan's ontology of the book and latter-day bibliographic conceptual models; at the same time, these differences make the similarities between Ranganthan's model and its modern analogues all the more striking.

Concluding Remarks

In the foregoing pages, we have considered Ranganathan's ontology of the book at some length and so it is appropriate to review briefly the course that we have traced. As we have seen, Ranganathan derived the structural lineaments of his model from the traditional Hindu ontology of the *jīva*, which holds that every living being consists of an *ātma* (= essential self or soul) *sūkṣma-śarīra* (subtle body)*,* and *sthūla-śarīra* (= gross body). Ranganathan adopted this threefold division for his conceptualization of what a book is, identifying the thought-content of a book as its soul, its linguistic or pictorial mode of expression as its subtle body, and its physical form as its gross body. The ontology of the *jīva* is embedded within a complex framework of metaphysical presuppositions, which Ranganathan creatively adapted to the bibliographic realm. A close reading of the passages in which Ranganathan discussed his ontology of the book has revealed that his model was the fruit of a mode of conceptual analysis that identified bibliographical entities and stipulatied relationships among them, much as current bibliographical conceptual models do. Although, for obvious chronological reasons, Ranganathan did not use formal E-R modelling techniques, his model can justifiably be considered to be a bibliographic conceptual model *avant la lettre*. In tracing the trajectory of the model across the various contexts in which Ranganathan deployed it, we have seen that he developed two versions of it: a triadic version in which the soul, subtle body, and gross body constitute the metaphysical parts of a book and a dyadic version, in which the elements of soul and subtle body are combined into the composite concept of expressed thought, which Ranganathan dubbed a "work", and the metaphysical parts of a book are thus reduced to the work and the gross body, now renamed a "document". Interestingly, Ranganathan preferred to invoke the dyadic version in his discussions of cataloging, while utilizing the triadic version in other contexts. Finally, detailed comparison between Ranga-nathan's ontology of the book and leading current bibliographic conceptual models – FRBR/IFLA-LRM and BIBFRAME – has shown that Ranganathan's triadic model of the book as a combination of soul, subtle body, and

gross body corresponds quite closely to the FRBR/IFLA-LRM entities Work, Expression, and Manifestation, while his dyadic model of the book as a composite of work and document maps remarkably well to the BIBFRAME entities of bf:Work and bf:Instance, even if, in other respects, there are significant structural differences across the models.

The correspondences between the entities in Ranganathan's ontology of the book and those in FRBR/IFLA-LRM and BIBFRAME are all the more striking as there is no evidence that the former exercised any influence on the formation of the latter. According to the chair of the IFLA study group that drafted the specifications for the earliest of the current models, FRBR, early versions of the model included as many as six different entities – "superwork", "work", "version", "edition", "item", and "component part" in one version and "aggregate, "work", "representation", "product", "carrier", and "item" in another – and these were, over time, reduced to the four present in the final model (Madison 2005, 31). It is thus evident that Ranganathan's triadic model did not serve as a template for the model and so it is historically inaccurate to claim that "[t]he FRBR model … is an extension of the one that Ranganathan … propounded" (Varghese 2008, 287). Nor does it appear that consideration of Ranga-nathan's model played any role in the elaboration of the BIBFRAME model, the template for which can perhaps ultimately be traced back to discussions surrounding FRBR.[28]

There is thus a curious lack of historical connection between Ranganathan's ontology of the book and later bibliographic conceptual models. This inevitably raises the question why later modelers of the bibliographic domain appear not to have drawn upon Ranganathan's model for inspiration, especially given his eminent reputation as a theorist of KO. Un-fortunately, our sources are silent on this point. Although it is well-nigh impossible to draw any definite conclusions from an *argumentum e silentio*, I venture the hypothesis that the neglect of Ranganthan's ontology of the book by later conceptual modelers stems from the compartmentalization of knowledge within librarianship. FRBR, IFLA-LRM, and BIBFRAME were all initiatives of the cataloging community and so the framers of these models sought their inspiration from the literature of bibliographical description. However, Ranganathan, as we have seen, tended to give the fullest expositions of his model in writings on topics falling outside of the realm of cataloging, such as book selection for librarians or the production of social literature, and even in publications more relevant to cataloging, such as *SB* or *PLC*, his model featured in discussions of secondary topics and so could be easily overlooked. Moreover, Ranganathan did not mention the ontology of the book in his works on cataloging, apart from including definitions of the work as expressed thought and the document as embodied thought in his discussions of cataloging terminology. Either published in books falling outside of cataloging literature or tucked away among secondary topics in works more relevant to cataloging, Ranganathan's presentations of his model were thus not well positioned to be read, and assimilated, by persons interested in issues of bibliographical description. Thus it appears that Ranganathan's ontology of the book fell through the cracks of different discourses within the field of librarianship that did not quite intersect: in this sense, it is perhaps best viewed as an example of "undiscovered public knowledge" (cf. Beghthol 1995).

---

[28] Madison (2005, 31-32) recounts that in the final stages of discussion on FRBR, there was a debate whether the model should include Work, Expression, and Manifestation, or whether these three entities should be merged into two. She notes that "at LC [i.e., Library of Congress—TMD], their draft E-R model defined three entities: the *work* as the intellectual, artistic, or creative content; the *manifestation* as the physical means through which a work has been realized, with set characteristics associated with a given production or publication; and the *item* as the unique instance of a manifestation." The tripartite structure of this Library of Congress proposal exactly matches that of BIBFRAME and, given that the latter was created at the Library of Congress as well, one may well wonder if BIBFRAME's structure might not ultimately derive from this early draft E-R model.

Within the history of KO, then, Ranganathan's ontology of the book occupies a position of splendid, if somewhat obscure, isolation, adumbrating but not influencing later develop-ments in bibliographical conceptual modeling. Nevertheless, its significance should not be minimized. For one thing, it offers a revealing example of how Ranganathan's cultural and religious background as a Hindu Brahmin exerted influence on his thinking and, by the same token, how his theorizing reflected, in some measure, not only his personality but his cultural and religious identity. More significantly, perhaps, in introducing the threefold distinction between the thought-content (= soul), mode of expression (= subtle body), and physical carrier (= gross body) of a book into library discourse, Ranganathan appears to pioneered a particularly potent – indeed, one might say, seminal – way of thinking about bibliographic resources and information more generally that has lost none of its relevance for today. One measure of this is that the creators of the FRBR/IFLA-LRM model adopted a similar distinction in defining their bibliographical entities and this model provides the theoretical underpinning for the structure of the catalog code currently in use. Another is that this type of distinction has found use in other informational models as well. For example, recently, the Basic Representational Model (BRM) has been "developed as a model to support digital preservation of scientific data"; it is intended to serve as "a general model for information representation and encoding in digital objects" (Wickett 2023, 4). This model consists of three entities, Propositional Content, Symbol Structure, and Patterned Matter and Energy, which stand in the following relationships to one another (p. 4, Figure 1):

4.1. [Propositional Content]<is expressed by>[Symbol Structure]
4.2. [Symbol Structure]<is encoded in>[Symbol Structure]
4.3. [Symbol Structure]<is inscribed in>[Patterned Matter and Energy]

If one prescinds from the self-reflexive relationship in Statement 4.2, the analogies between the BRM and Ranganathan's model are patent. The BRM's Propositional Content entity, which refers to abstract truth-bearing statements (p. 5), broadly corresponds to Ranga-nathan's thought-content, or soul; the Symbol Structure entity, which refers to "the arrange-ments of symbols that express semantic content in a given context or encode other symbol structures within a computational system" (p. 5), correlates well to mode of expression, or subtle body; and the Patterned Matter and Energy entity has obvious affinities to physical form, or gross body. When one turns to the relationships, it is evident that Statement 4.1 ("Propositional Content is expressed by Symbol Structure") is strongly reminiscent of Statement 3.1 ("Soul [=Thought] is expressed by Subtle body [= Language/Illustrations]"), while Statement 4.3 ("Symbol Structure is inscribed in Patterned Matter and Energy") is analogous Statement 1.3 ("Subtle body [= Language/Illustrations] is impressed upon Gross body [= Physique]"). Now the BRM is designed to take account of all manner of digital as well as physical objects, whereas Ranganathan's model was restricted to physical documents alone (cf. n. 18 above): nevertheless, it is apparent that both models are making the same kinds of distinctions and, in this respect, they share a common structure. The fact that Ranganathan's ontology of the book proposed a structure that has reemerged, *mutatis mutandis*, in current models such as IFLA-LRM and the BRM suggests that, in formulating his model, Ranganathan may have uncovered a deep and enduring truth about the ontological articulation of information in the world.

Acknowledgments

References

Thomas M. Dousa. 2023. S.R. Ranganathan's Ontology of the Book: On a Bibliographical Conceptual Model avant la lettre. NASKO, Vol. 9. pp. 89-120.

Almeida, Patricia de. 2022. "Shiyali Ramamrita Ranganathan: uma biografia." *Páginas a&b*, S.3, no. 18: 99-119.

Baker, Thomas, Coyle, Karen, & Petiya, Sean. 2014. "Multi-Entity Models of Resource Description in the Semantic Web: A Comparison of FRBR, RDA, and BIBFRAME." *Library Hi Tech*, 32/4: 562-582.

Beghtol, Clare. 1995. "'Facets' as Interdisciplinary Undiscovered Public Knowledge: S.R. Ranga-nathan in India and L. Guttman in Israel." *Journal of Documentation*, 51/3: 194-224.

Bianchini, Carlo. 2015. *I fondamenti della biblioteconomia: attualità del pensiero di S.R. Ranganthan*. Biblioteconomia e scienza dell'informazione, 9. Milano: Editrice Bibliografica.

Bianchini, Carlo. 2017. "Osservazioni sul modello IFLA Library Reference Model." *JLIS.it*, 8/3: 88-99. Accessed May 21, 2023 at: https://www.jlis.it/index.php/jlis/article/view/128/128

Brodbeck, Simon. 2003. "Introduction." In Juan Mascaró (tr.). *The Bhagavad Gita*. London: Penguin Books, pp. xi-xxix.

Brower, Jeffrey E. 2014. *Aquinas's Ontology of the Material World: Change, Hylomorphism, & Material Objects*. Oxford: Oxford University Press.

Buckland, Michael K. 1997. "What is a Document?" *Journal of the American Society for Information Science*, 48(9): 804-809.

Chatterjee, Satischandra & Datta, Dhirendramohan. 2016 [1968]. *An Introduction to Indian Philosophy*. Delhi: Motilal Banarsidass Publishers.

Coyle, Karen. 2015. "FRBR, Twenty Years on." *Cataloging & Classification Quarterly*, 53/3-4: 265-285.

Coyle, Karen. 2016. *FRBR, Before and After: A Look at Our Bibliographical Models*. Chicago: ALA Editions.

Croissant, Charles R. 2012. "FRBR and RDA: What They Are and How They May Affect the Future of Libraries." *Theological Librarianship*, 5(2): 6-22.

Dandekar, R.N. 1962. "Man in Hindu Thought." *Annals of the Bhandarkar Oriental Research Institute*, 43, 1-4: 1-57.

Dasgupta, Surendranath. 1975. *A History of Indian Philosophy*, Volume II. Delhi: Motilal Banarsidass.

Denton, William. 2007. "FRBR and the History of Cataloging." In *Understanding FRBR: What It Is and How It Will Affect Our Retrieval Tools*. ed., Arlene G. Taylor. Westport, Connecticut/London: Libraries Unlimited.

Dousa, Thomas M. 2017. "E. Wyndham Hulme's Classification of the Attributes of Books: On an Early Model of a Core Bibliographical Entity." *Knowledge Organization*, 44/8 (2017), 592-604.

Flood, Gavin. 1996. *An Introduction to Hinduism*. Cambridge: Cambridge University Press.

Gnoli, Claudio. 2016. "Classifying Phenomena Part 1: Dimensions." *Knowledge Organization*, 43/6: 403-415.

Grimes, John. 1989. *A Concise Dictionary of Indian Philosophy: Sanskrit Terms Defined in English*. Albany: State University of New York Press.

Gupta, Bina. 2021. *An Introduction to Indian Philosophy: Perspectives on Reality, Knowledge, and Freedom*. 2nd ed. New York/London: Routledge.

Hahn, Jim, & Dousa, Thomas M. 2020. "Mapping bf:Work to lrm:Work and lrm:Expression: towards a set-theoretical approach." *Proceedings of the Association for Information Science and Techno-logy*, 57/1. Accessed May 23, 2023 at: https://asistdl.onlinelibrary.wiley.com/doi/10.1002/pra2.408

Hamilton, Susan. 2001. *Indian Philosophy: A Very Short Introduction*. Oxford: Oxford University Press.

Hick, John H. 1990. *Philosophy of Religion*. Upper Saddle River, New Jersey: Prentice Hall.

IFLA Study Group on the Functional Requirements for Bibliographic Records. 1998. *Functional Requirements for Bibliographic Records: Final Report*. UBCIM Publications, New Series, Vol. 19. München: KG Saur : IFLA Section on Cataloguing.

Johnson, W.J. 2009. *A Dictionary of Hinduism*. 1st ed. Oxford: Oxford University Press.

Kalidasa. 2016. *Raghuvamsam: The Line of Raghu*. tr., A.N.D. Haskar. Haryana, India: Penguin Books India.

Kaula, P.S.G. 1992. *Ranganathan: A Multi-Faceted Personality: A Centenary Tribute*. Delhi: B.R. Publishing Corporation.

Kroeger, Angela. 2013. "The Road to BIBFRAME: The Evolution of the Idea of Bibliographic Transition into a Post-MARC Future." *Cataloging & Classification Quarterly*, 51: 873-890.

Thomas M. Dousa. 2023. S.R. Ranganathan's Ontology of the Book: On a Bibliographical Conceptual Model avant la lettre. NASKO, Vol. 9. pp. 89-120.

Larson, Gerald James. 2018. "Pātañjala Yoga's Theory of 'Many-Lives' through Karma and Rebirth and Its Eccentric Theism." *Religions*, 9(1) 4: 1-9. Accessed May 21, 2023 at:
https://www.mdpi.com/2077-1444/9/1/4

Library of Congress. 2012. *Bibliographic Framework as a Web of Data: Linked Data Model and Supporting Services*. Washington, DC: Library of Congress.

Library of Congress. 2016. *Overview of the BIBFRAME 2.0 Model*. Accessed March 2, 2023 at: https://www.loc.gov/bibframe/docs/bibframe2-model.html

Lubetzky, Seymour. 2001 [1969]. "Principles of Cataloging. Final Report. Phase I: Descriptive Cataloging." In *Seymour Lubetzky: Writings on the Classical Art of Cataloging*. ed., Elaine Svenonius, Dorothy McGarry. Englewood, Colorado: Libraries Unlimited, 259-341.

Madison, Olivia M.A. 2005. "The Origins of the IFLA Study on Functional Requirements for Bibliographic Records." *Cataloging & Classification Quarterly*, 39/3-4: 15-37.

Majumdar, A.K. 1925. "The Doctrine of Evolution in the Sankhya Philosophy." *The Philosophical Review*, 34/1: 51-69.

Malhotra, Rajiv, & Babaji, Satyanarayana Dasa. 2020. *Sanskrit Non-Translatables*. New Delhi: Amaryllis.

Masceró, Juan (tr.), *The Bhagavad Gita*. Penguin Classics. London: Penguin Books.

McCallum, Sally. 2016. "BIBFRAME and Linked Data for Libraries.", in *Linked Data for Cultural Heritage*. Ed. Ed Jones, Michelle Seikel. Chicago: ALA Editions, 105-123.

McClelland, Norman C. 2010. *Encyclopedia of Reincarnation and Karma*. Jefferson, North Carolina: McFarland & Company, Inc.

Novák, Lukáš & Dvořák, Petr. 2011. *Úvod do logiky aristotelské tradice*. 2nd ed. Praha: Kryštal.

Olivelle, Patrick (tr.). 1999. *The Pañcatantra: The Book of India's Folk Wisdom*. Oxford World's Classics. Oxford: Oxford University Press.

Park, Jung-Ran, Brenza, Andrew, & Richards, Lori. 2020. "BIBFRAME Linked Data: A Conceptual Study on Prevailing Contentt Standards and Data Model." In Kingsley Okoye (ed.), *Linked Open Data: Applications, Trends and Future Developments*. [London]: IntechOpen Limited, 1-18. Accessed May 24, 2023, at: https://www.intechopen.com/chapters/71884

Paul, Dhirendra Nath. 1921. *The Hindu Philosophy*. 3rd ed. Calcutta: Datta Bose & Co.

Pasnau, Robert. 2011. *Metaphysical Themes, 1274-1671*. Oxford: Clarendon Press.

Ranganathan, S.R. 1948. *Preface to Library Science*. Delhi: University of Delhi.

Ranganathan, S.R. 1951. "Documentation." *Libri*, 1: 253-260.

Ranganathan, S.R. 1952a. *Library Book Selection*. Indian Library Association English Series, 5. Delhi: Indian Library Association; London: G. Blunt & Sons.

Ranganathan, S.R. 1952b. *Social Bibliography, or, Physical Bibliography for Librarians*. Dehli University Publications, Library Science Series, 4. Delhi: University of Delhi.

Ranganathan, S.R. 1952c. *Social Education Literature for Authors, Artists, Publishers, Teachers, Librarians, and Governments*. Indian Adult Education Association, English Series 5. Delhi: Indian Adult Education Association; London: G. Blunt & Sons.

Ranganathan, S.R. 1953. "Approach to Depth Classification", in S.R. Ranganathan (ed.), *Depth Classification and Reference Service & Reference Material*. Delhi: Indian Library Association; London: G. Blunt & Sons, 12-26.

Ranganathan, S.R. 1955. *Heading and Canons: Comparative Study of Five Catalog Codes*. Madras : S Viswanathan; London: G. Blunt and Sons.

Ranganathan, S.R. 1957. *Prolegomena to Library Classification*. 2nd Edition. London: The Library Association.

Ranganathan, S.R. 1974. *Physical Bibliography for Librarians*. New York: Asia Publishing House.

Ranganathan, S.R. 1992. *A Librarian Looks Back: An Autobiography of Dr. S.R. Ranganathan*. Kaula Series in Library Science, 11. New Delhi: ABC Publications.

Ranganathan, S.R. 2006 [1960]. *Colon Classification*. 6th Edition. Bangalore: Ess Ess Publications for the Sarada Ranganathan Endowment for Library Science.

Ranganathan, S.R. 2006 [1966]. *Library Book Selection*. 2nd Edition. Bangalore: Ess Ess Publications for the Sarada Ranganathan Endowment for Library Science.

Thomas M. Dousa. 2023. S.R. Ranganathan's Ontology of the Book: On a Bibliographical Conceptual Model avant la lettre. NASKO, Vol. 9. pp. 89-120.

Ranganathan, S.R. 2006 [1973]. *Documentation: Genesis and Development*. Bangalore: Ess Ess Publications for the Sarada Ranganathan Endowment for Library Science.

Ranganathan, S.R. 2006 [1989]. *Prolegomena to Library Classification*, 3rd Edition. Bangalore: Ess Ess Publications for the Sarada Ranganathan Endowment for Library Science.

Ranganathan, S.R. 2006 [1988]. *Classified Catalogue Code with Additional Rules for Dictionary Catalogue Code*. 5th Edition. Ess Ess Publications for the Sarada Ranganathan Endowment for Library Science.

Riva, Pat. 2016. "Il nuovo modello concettuale dell'universo bibliografico: FRBR Library Reference Model.", *AIB studi*, 52/2: 265-275.

Riva, Pat, Le Boeuf, Patrick, & Žumer, Maja. 2017. *IFLA Library Reference Model: A Conceptual Model for Bibliographic Information*. Den Haag, Netherlands: IFLA; accessed February 26, 2023 at https://repository.ifla.org/handle/123456789/40

Seikel, Mchele & Steele, Thomas. "Comparison of Key Entities within Bibliographic Conceptual Models and Implementations: Definitions, Evolution, and Relationships." *Library Resources and Technical Services*, 64/2: 62-71.

Smiraglia, Richard. 2001. *The Nature of a "Work": Implications for the Organization of Knowledge*. Lanham, Maryland/London: Scarecrow Press.

Svenonius, Elaine. 1992. "Bibliographic Entities and their Uses." In *Seminar on Bibliographic Records: Proceedings of the Seminar Held in Stockholm, 15-16 August 1990, and Sponsored by the IFLA UBCIM Programme and the IFLA Division of Bibliographic Control*. (UBCIM Publications—New Series, 7). München: K.G. Saur, 3-18.

Svenonius, Elaine. 2000. *The Intellectual Foundation of Knowledge Organization*. Digital Libraries and Electronic Publishing. Cambridge, Massachusetts/London: The MIT Press.

Tennis, Joseph T. 2011. "Is There a New Bibliography?" *Cataloging and Classification Quarterly*, 49(2): 121-126.

Tillett, Barbara. "A Taxonomy of Bibliographic Relationships." *Library Resources & Technical Services*, 35/2: 150-158.

Varghese, M. 2008. Relevance of a Classified Catalog in the FRBR Perspective and a Proposed Model with ISBD Description and Faceted Class Number as Key Attribute." *Cataloging & Classification Quarterly*, 46/3: 281-304.

Wickett, Karen. 2023. "Critical Data Modeling and the Basic Representation Model." *Journal of the Association of Information Science and Technology*, 2023: 1-11. Accessed May 25, 2023 at: https://asistdl.onlinelibrary.wiley.com/doi/10.1002/asi.24745