Conceptualizing the World in Pali Literature[1]

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I say, monks, that you cannot know, see or reach the world's end by travelling there. And yet, without reaching the world's end you cannot put an end to pain.

This seemingly paradoxical statement appears in the *Loka Sutta* in the *Saṃyutta Nikāya*.[2] The monks who first heard it were thoroughly confused. How can we transcend the world and end human suffering when we cannot physically escape it? The Buddha left it to his attendant, Ānanda, to explain to the bemused monks what he meant. Ānanda discloses that while physical transcendence may be impossible, the ending of suffering still depends on transcending a different kind of world, the sensory world of human experience. The Buddha of the Pali canon frequently uses such wordplays to redirect his followers' attention away from the external world and instead to their interior lives as the ground for spiritual liberation. Consequently, Richard Gombrich, Sue Hamilton, and others have favoured interpreting references to other spatio-temporal worlds in the Buddha's discourses as primarily figurative rather than literal.[3]

Rupert Gethin challenged such interpretations as a false dichotomy in his article "Cosmology and Meditation" (1997). He described how early Buddhist thought assimilated subjective experience to the external world and gave the former priority in explaining reality. However, he also argued that this need not imply that the Buddha's references to heavens, hells, or other cosmological processes should be interpreted only in metaphorical terms. Unfortunately, attempts to explain away later cosmological speculation as a misreading of the historical

[1] The research for this article has been supported by a Singapore Ministry of Education Academic Research Fund Tier 2 grant (MOE-T2EP40221-0006).

[2] *Saṃyutta Nikāya* iv 93: nāhaṃ bhikkhave gamanena lokassa antaṃ ñāteyyaṃ daṭṭheyyaṃ patteyyan ti vadāmi. na ca panāhaṃ bhikkhave appatvā lokassa antaṃ dukkhassa antakiriyaṃ vadāmī ti. Compare also *Saṃyutta Nikāya* i 41; i 98; ii 73; iv 52; v 175; v 435; *Aṅguttara Nikāya* ii 23; *Udāna* 32; *Itivuttaka* 121.

[3] See, for instance, Gombrich 2006: 80–89; Hamilton 1999, esp. 82: "My view is…that the metaphor should be taken as the 'norm' and that passages which apparently refer to cosmological levels in spacial terms should be interpreted metaphorically and not literally as the Theravāda tradition later did."

Buddha's original intentions have a long history in our field and continue to persist. It is noteworthy that after almost two centuries, there is still no thorough study of Theravada cosmology in a European language. The neglect is particularly unfortunate for Pali studies, as cosmology developed into an important genre of monastic writing in the second millennium.

The full extent of this cosmological literature also remains relatively little known in European language scholarship. The earliest surveys of Pali literature hardly mentioned cosmological texts, and the little information they did give was often inaccurate and incomplete.[4] The situation improved with later studies such as K. R. Norman's *Pāli Literature* (1983) and Oskar von Hinüber's *A Handbook of Pāli Literature* (1996).[5] The descriptions of the six cosmological works listed in the latter remain the most detailed English-language source we have on this genre of monastic writing. My lecture today builds on this foundational empirical work and provides a complete overview of all known Pali cosmological texts.[6] In addition, I provide some intellectual shape to this bibliography by tracing the history of this literature through the development of the different schemas scholar-monks used to think about the cosmos.

1. From cosmos to cosmology

The Pali textual tradition is a densely interwoven cultural system. As such, a history of the formal development of Pali cosmology must necessarily begin with the earliest threads of the tradition's thinking about the world or *loka*. While some may have gone too far in claiming that the Buddha held no beliefs about the external world, the discourses preserved in the *nikāya*s indeed offer us no systematic cosmology. It is not that the cosmos is peripheral to the

[4] Two works are described in Geiger 1916 (*Lokadīpakasāra*, *Pañcagatidīpanī*), one in Churn Law 1933 (*Pañcagatidīpanī*), and three in Norman 1983 (*Pañcagatidīpanī*, *Lokapaññatti*, *Cakkavāḷadīpanī*). Bode 1909, relying mainly on Forchhammer 1882, mentioned at least five cosmological works by name (*Chagatidīpanī*, *Aruṇavatisūtra*, *Lokapaññatti*, *Lokuppatti* and *Lokadīpakasāra*) but without giving much or any detail about their genre or contents.

[5] Peter Skilling has also done much to shed light on the Pali cosmological texts that have circulated in Southeast Asia. See, for instance, Skilling 1990; 2009 (esp. chs. 1, 4); 2018.

[6] This is based on the available texts and secondary studies, but there will likely be more that come to light.

*nikāya*s. On the contrary, the Buddha's teachings place at centre stage a parade of beings and their realms, including gods, demons, nature spirits, dragons, and ghosts. It is just that the Buddha never provides a structured and coherent overview of this cosmos as an ordered whole, as we find in the Dharmagupta *Dīrghāgama*, for instance.[7] Instead, the most frequent schema encountered is simply a dichotomous one distinguishing between this world and the next (*ayaṃ loko*, *paro loko*). What is 'next' is open-ended and stands for any possible realm of rebirth.[8]

Nevertheless, I would argue that the Buddha's teachings presented his early followers with a situational logic that stimulated the intellectual development of more complex cosmologies. At a fundamental level, the idea of nirvana as something transcending the world provided categorical limits through which the world could be thought about and analyzed. For instance, in early descriptions of meditation, the *nikāya*s developed hierarchical models of consciousness and the psycho-moral qualities that accompanied different mental states. Similarly, the canonical theories of karma and rebirth introduced the idea that living beings are organised against a moral scale. However, these early maps of meditation and rebirth were not always consistent and comprehensive, and it was up to later monks to even out the details. Some of this systematization began even during the compilation of the *nikāya*s. For instance, the redactors of the *Saṃyutta Nikāya* arranged a series of *sutta*s on rebirth according to a typology of five destinies (*pañcagati*): the hells and realms of animals, ghosts, humans, and gods.[9]

This systematization of the world became more comprehensive in the Abhidhamma. Within it, we find the first attempts at constructing a formal cosmology out of the different world orders emerging from the *nikāya*s.[10] For instance, the *Vibhaṅga* ends with a chapter entitled 'analysing the teaching's heart' (*dhammahadayavibhaṅga*). It contains a detailed description of the cosmos in terms of thirty-one realms within three worlds, the *kāmaloka* (desire world), *rūpaloka* (form world), and *arūpaloka* (formless world). Furthermore, it uses hierarchies of different mental states as a framework to order the various realms of living beings and the types of consciousness they can experience. At the level of the *kāmaloka*, for instance, we find

[7] *Dīrghāgama* 30 (Taishō I, No. 30, 114b–149c). See also Anālayo 2014.

[8] On the idea of the *loka* in the Pali canon, see Hashimoto 1980; 1982; 1985.

[9] *Saṃyutta Nikāya* v 474–477. On the connection between the organizational methods of the *Saṃyutta Nikāya* and the early *Abhidhamma*, see Gethin 2020.

[10] *Dhammasaṅgaṇi*, 223–4; *Paṭisambhidāmagga* I, 83–84; *Vibhaṅga*, 401–36.

distinguished, according to their psychological states, four lower realms (hell beings, animals, ghosts, and *asura*s 'jealous gods') and seven higher realms (human beings and six other types of gods). The Abhidhamma thus integrated the nascent maps of mental states and rebirth realms found in the *nikāya*s to construct a unified, psychologically-grounded cosmology.

However, the Pali Abhidhamma's description of this three-world cosmos primarily in terms of the different mental states experienceable in each realm is still less detailed when compared with the Sarvāstivāda Abhidharma. There are no systematic descriptions of the world's spatial and temporal structure comparable with those that were likely articulated in the *Prajñaptiśāstra*, for instance.[11] Nevertheless, the material was, of course, there in the canon to construct such an image of the cosmos. In it we find the rudiments of the belief in a physical world dominated by Mount Sineru with four great continents and oceans. The canon also contains complex theories that the world goes through cycles of de- and re-generation and that human society follows similar patterns in its moral development.[12] However, the Abhidhamma's earliest three-world model did not incorporate these spatial and temporal elements. Instead, it was up to later commentators to theorize how these aspects related to its worldview.

2. Expanding the Buddha's mind

There is no simple answer as to why the Pali canon has a less developed cosmology than other Indian Buddhist scriptural traditions. But one factor could be that the early Pali tradition held different views on the scope of the Buddha's power and knowledge.[13] There is perhaps a connection in Buddhist intellectual history between increasingly lofty conceptions of the Buddha and the ever-more detailed cosmologies associated with his wisdom. For instance, Vincent Tournier has argued that Mahāsāṅghika-Lokottaravādin ideas about the Buddha's

[11] I say "likely" as our understanding of the contents of the *Lokaprajñaptiśāstra* depend on later Chinese and Tibetan translations. On the *Lokaprajñaptiśāstra*, see La Vallée Poussin 1914–18: 295–326; Willemen et al. 1998: 70–71; 189–97, and the references therein.

[12] See Kirfel 1920: 178–207 for an overview the various cosmological details given in the Pali canon.

[13] On the connections between the development of the Abhidharma and changing conceptions of the Buddha's omniscience, see Anālayo 2014: 91– 127.

supramundane status informed the composition of the *Mahāvastu*'s long cosmological discourse in its first part.[14] Similarly, Sarvāstivāda-Vaibhāṣika views about the Buddha's understanding of anything knowable, whether conventional or absolute, are consonant with the broader scope of the *Prajñaptiśāstra*'s cosmology.[15] However, it is unclear whether the *nikāya*s and early Abhidhamma viewed the Buddha as omniscient in a similarly broad sense.[16] And by the time later Abhidhamma works and the commentaries explicitly developed similar ideas, the canon may well have been closed to the introduction of new cosmological material.

There are inklings that the tradition had changed its thinking about the scope of the Buddha's knowledge in Buddhaghosa's *Visuddhimagga*, specifically, his discussion of the Buddha's status as a 'knower of worlds' (*lokavidū*).[17] There, Buddhaghosa begins by defining the Buddha's knowledge of the *loka* in familiar terms as his understanding of conscious experience. But he then pivots and describes the Buddha's knowledge as encompassing a new three-world model: the *saṅkhāraloka* (world of formations, conditioned phenomena analyzed in terms of dhammas), the *sattaloka* (world of living beings), and the *okāsaloka* (world of space, the insentient physical world). It is noteworthy that in an equivalent passage in the Chinese translation of the *Vimuttimagga*, a source possibly known to Buddhaghosa, the Buddha's knowledge is defined only in terms of the *saṅkhāra-* and *satta- loka*s.[18] While Buddhaghosa cites canonical passages to justify his schema, he introduces a good deal of new material, especially in his description of the universe's or *cakkavāḷa*'s physical features. For example, he describes Mount Sineru, Jambudīpa, and its Jambu tree as follows:

Sineru, the largest of all mountains, plunges beneath the sea
for eighty-four thousand *yojana*s and rises out the same in height.
Next comes a series of vast ranges, divine and spotted with gems.
Each in height and depth measures half the size of the one before.

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[14] Tournier 2017: 225–33.

[15] Dhammajoti 2015: 273–322, esp. 290–92, citing *Mahāvibhāṣāśāstra* Taishō 1545 382c–383a; 887b. See also Guang Xing 2005: 44–45; McClintok 2010: 32–33.

[16] Endo 2002: 58–79; Anālayo 2006: 1–20; Anālayo 2014: 91– 127; Heim 2018: 33–59.

[17] *Visuddhimagga* of Buddhaghosa 7.168–70, §§36–45 ≈ *Samantapāsādikā* I, 117–20.

[18] *Vimuttimagga* (Taishō XXXII, no. 1648, 399c–461c), trans. Ehara et al. 1961: 143. See also Sasaki 2018: 161.

They are named Yugandhara, Īsadhara, Karavīka,
Sudassana, Nemindhara, Vinataka, and Assakaṇṇa.
These seven great mountain rings surrounding Sineru
are home to the four great kings and are visited by gods and Yakkhas.
The lofty Himālaya is five hundred *yojana*s in height,
is three thousand *yojana*s in length and width,
and is adorned with eighty-four thousand peaks.
Jambudīpa is known for the magnificence of its Jambu tree.
Called "Naga," the tree's trunk is fifteen *yojana*s in circumference.
In length, its trunk measures fifty *yojana*s, and so too its branches on all sides.
Thus, the tree shades a hundred *yojana*s and rises the same in height.[19]

Buddhaghosa likely borrowed from outside the Mahāvihāran tradition when adding the *okāsaloka* to his schema. A distinction between a world of sentient beings (*sattvaloka*) and the physical world (*bhājanaloka*, lit. "container world") structures the third chapter of Vasubandhu's *Abhidharmakośabhāṣya*, for instance, and becomes relatively standard in subsequent Buddhist Sanskrit cosmological works.[20] Buddhaghosa and the early commentators also share a similar numerology with other Indian Buddhist traditions that governs the dimensions of the different aspects of the physical world. At every opportunity, they expand upon passing references in the canon to the features of the world. They precisely calculate their relative size and treat this knowledge as something the Buddha implicitly knew. It is unclear where this complex numerological system originated. However, the overlap in some details

[19] *Visuddhimagga* of Buddhaghosa 7.170, §42; ≈ *Samantapāsādikā* I, 119; *Atthasālinī* 298: caturāsīti sahassāni ajjhogāḷho mahaṇṇave | accuggato tāvad eva sineru pabbatuttamo ||
tato upaḍḍhupaḍḍhena pamāṇena yathākkamaṃ | ajjhogāḷhuggatā dibbā nānāratanacittitā ||
yugandharo īsadharo karavīko sudassano | nemindharo vinatako assakaṇṇo giri brahā ||
ete satta mahāselā sinerussa samantato | mahārājānam āvāsā devayakkhanisevitā ||
yojanānaṃ satān' ucco himavā pañca pabbato | yojanānaṃ sahassāni tīṇi āyatavitthato |
caturāsītisahassehi kūṭehi paṭimaṇḍito || tipañcayojanakkhandhaparikkhepā nagavhayā |
paññāsayojanakkhandhasākhāyāmā samantato | satayojanavitthiṇṇā tāvad eva ca uggatā |
jambu yass' ānubhāvena jambudīpo pakāsito ||

[20] *Abhidharmakośabhāṣya* of Vasubandhu, ch. 3; *Mahāprajñāpāramitā-upadeśa* (Taishō XXV, no. 1509, 546c1); *Dharmasaṅgraha* of Nāgārjuna (?), §89; *Mahāsaṃvartanīkathā* of Sarvarakṣita, ch. 5.

between Buddhist, Brahmanical, and Jain traditions may indicate an early convergence among religions about the nature of the universe and what an omniscient being should know.[21]

The Pali commentators sometimes explore the precise relationship between the spatial, *cakkavāḷa* cosmology and the three-world schema systematized in the Abhidhamma, especially the realms of the *kāmaloka*. For instance, the *Vibhaṅga* commentary describes how the heavens of the four great kings (*cātumahārājika*) and the thirty-three gods (*tāvatiṃsā*) are partially situated on different parts of Mount Sineru. While the mountain forms the physical center of the heavens, the realms extend horizontally from the mountain into space until they reach the rock face at the edge of the *cakkavāḷa* or world sphere. The sun and moon gods, and the constellations, also form a part of the heaven of the four great kings.[22] Similarly, we find sporadic references to the spatial locations of the other realms of the *kāmaloka* throughout the *nikāya* commentaries.[23] Again, while this marks a new development in the Pali tradition, it is comparable with what we find in Sanskrit works, such as the *Abhidharmakośabhāṣya*.[24]

Likewise, Buddhaghosa's theory of cosmic time shares much with other Buddhist traditions. While he ignores the issue of time when formulating his new three-world model, he addresses it in the *Visuddhimagga* when discussing knowledge of past lives.[25] He frames his analysis of time using the *Kappa Sutta*'s description of the four phases of de- and re-generation that the universe cycles through in a great eon (*mahākappa*).[26] He situates within this framework

[21] For an overview of these basic similarities and differences, see Kirfel 1967: 1–28.

[22] *Sammohavinodanī* 519. The *Sammohavinodanī* does not specifically mention the gods of the constellations (*nakkhatta*). However, their inclusion is described in *Atthasālinī* (318) and *Sāratthappakāsinī* (i 295).

[23] The recent work by Punnadhammo (2018) gathers a number of these references. For instance, the *asura*s reside at the bottom of Mount Sineru under the ocean (*Sāratthappakāsinī* i 338; *Paramatthajotikā* II ii 485) and the Avīci hell is located beneath the surface of the *cakkavāḷā* (*Paramatthamañjusā* B^{e} i 243).

[24] See also the *Lokaprajñaptiśāstra* (summary in La Vallée Poussin 1914–18: 295–326) and the *Lokaprajñapti* (Taishō XXXII, no. 1644).

[25] *Visuddhimagga* XIII.13–71.

[26] *Kappa Sutta, Aṅguttara Nikāya* II, 142. See also Hiltebeitel 2011: 246–260. The four phases consist of a *saṃvaṭṭa-kappa* (aeon of degeneration), a *saṃvaṭṭaṭṭhāyi-kappa*, where a degenerated state persists, a *vivaṭṭa-kappa* (aeon of regeneration), and a *vivaṭṭaṭṭhāyi-kappa*, where a regenerated state persists

canonical material about the world's decline and renewal (mainly from the *Aggañña* and *Sattasuriya Sutta*s). In doing so, he more explicitly centers these narratives on the *cakkavāḷa* topography and how it changes over time. Buddhaghosa also systematically defines the spatial breadth of these changes in terms of the three fields (*khetta*) of the Buddha's power: his field of birth (10,000 *cakkavāḷa*s in extent); his field of authority (100,000 *koṭi*s of *cakkavāḷa*s in extent); and the field of his knowledge's immeasurable scope.[27] Finally, he also defines the spatial height of cosmic flux in terms of the earlier three-world, thirty-one realm schema. He describes how the universe's destruction begins at the bottom hells, extends gradually through the *kāmaloka*, and ends partway through the *rūpaloka*, sparing those in the highest realms.[28]

3. The Buddha speaks again

The complex contribution of the first-millennium Pali commentaries to cosmological thought certainly deserves a more detailed analysis. Nevertheless, for now it may be enough to highlight that one of the main contributions of these works was to take the canon's various perspectives on the world — whether in terms of ultimate *dhamma*s, hierarchies of living beings, the *cakkavāḷa* topography, or the universe's temporal order — and to draw connections between them. Particularly crucial, as mentioned, was Buddhaghosa's redefinition of the scope of the Buddha's omniscience in terms of a new three-world schema comprising the *saṅkhāra*, *satta*, and *okāsa* worlds. While the Pali canon contains the primary threads of this cosmology, the commentators added information and organizational frameworks not found in their scriptural tradition. However, this development brought a niggling contradiction into the fold in that now, the commentaries, not the canon, solely preserved crucial aspects of the Buddha's thought.

The glaring omission of much of this information in their canonical scriptures likely became more conspicuous as scholar monks came across other traditions' cosmological texts that the

[27] His field of birth (*jātikhetta*) comprises the 10,000 *cakkavāḷa*s that tremble at his conception, birth, enlightenment, first sermon, decision to pass away, and death. His field of authority (*āṇakhetta*) comprises the 100,000 *koṭi*s of *cakkavāḷa*s where *paritta* texts are efficacious). His field of scope (*visayakhetta*) refers to the extent of his knowledge, which is immeasurable.

[28] For a detailed discussion this topic and related ideas in the *Abhidharmakośabhāṣya*, see Gethin 1997: 195–201.

Buddha had apparently taught. By the beginning of the second millennium, the logical rewards of incorporating such works within the Pali scriptural tradition seem to have outweighed the social risks of adding to what had been a closed canon. The *Lokapaññatti* is perhaps the earliest instance of the incorporation and translation of a Sanskrit (or possibly Prakrit) cosmological work in the Pali tradition. The *Lokapaññatti*'s now lost primary source, the *Lokaprajñapti*, was likely the oldest cosmological work of the Sāṃmitīya school.[29] The Indian monk Paramārtha translated a version of it into Chinese in 559, and it is this text that Paul Mus first used to ascertain the work that the *Lokapaññatti*'s author used as a model.[30]

Like its Sanskrit counterpart, the *Lokapaññatti* takes the form of a *sutta* that the Buddha supposedly spoke at the Jetavana *ārāma* in Sāvatthi. The lack of internal information about the origin of the Pali work or the scholar-monk who composed it means it is challenging to historicize. In his dissertation, Eugene Denis assessed previous claims about the work's date and place of composition. Based on the evidence of the text's reception and style, he suggested that it was composed in Burma in the eleventh or twelfth century. Still, he doubts the often repeated but uncorroborated claim that a certain Saddhammaghosa composed the *Lokapaññatti* and another Pali cosmological text, the *Chagatidīpanī*.[31] The earliest known work possibly to mention the *Lokapaññatti* was, until now, the Thai *Traibhūmikathā* composed in 1345. However, I recently found quotations from the text in the *Jinālaṅkāravaṇṇanā*.[32] This work claims to be the auto-commentary of Buddharakkhita, who authored the *Jinālaṅkāra* in southern Sri Lanka in 1156. This possible Sri Lankan connection may lend credence to the statement in the *Piṭakat-tō-sa-muiṅ* that the *Lokapaññatti* was composed in Anurādhapura.[33]

[29] On the sectarian affiliation of the *Lokaprajñapti*, see Okano 1998, 55–60; 2009. Other minor sources of the *Lokapaññatti* include texts such as the *Mahāvastu* and *Divyāvadāna* (Denis 1977 I: xxix–xlix).

[30] Mus 1939: 117–133.

[31] Denis 1977 I: i–x. The attribution of the *Lokapaññatti* and *Chagatidīpanī* to a 'Saddhammaghosa of Thaton' originates in Forchhammer 1882: xxvi. It was then amplified in Bode 1909: 104 and Mus 1939: 33–65.

[32] *Jinālaṅkāravaṇṇanā* 49–50.

[33] Nyunt 2012: 75.

While their common authorship is doubtful, the *Lokapaññatti* and *Chagatidīpanī* are closely associated and circulated together in Burma.[34] The *Chagatidīpanī* describes the six realms of rebirth in the *kāmaloka*. It is a translation of the *Ṣaḍgatikārikā*, a second to fourth-century Sanskrit work that was also translated into Tibetan in the early ninth century (at the latest) and twice into Chinese at the turn of the eleventh century.[35] The Sanskrit text is ascribed to Aśvaghoṣa in the Chinese tradition and Dharmasubhūtighoṣa in the Tibetan. The *Chagatidīpanī* developed an anonymous Pali commentary that shares parallel passages with the *Lokapaññatti*.[36] In its preamble, the commentary states that an 'Assaghosa' composed the Sanskrit *Ṣaḍgatikārikā* as an abridgment for the *Saddharma-smṛty-upasthāna Sūtra* (Taishō XVII, no. 721) and that a monk translated it into Pali for the sake of dimwits (*mudupaññā*).[37] A later Thai recension of the Pali work subsumes the *asura* realm within the *peta* realm to make it more consistent with the orthodox Theravada view that there are only five *gati*s.[38]

The *Lokapaññatti*, *Chagatidipanī*, and the *Chagatidīpanī* commentary adopt similar visions of the world. They all feature the *gati*s of the *kāmaloka* prominently and largely ignore the *rūpa-* and *arūpaloka*s of the older three-world, thirty-one realm system. As Paul Mus noted, the Pali *Lokapaññatti* appears to have been revised to treat the *gati*s more systematically. While in its first half, the work describes somewhat randomly various realms in the *cakkavāḷa*, its second half includes a more extended analysis of the six *gati*s from the hells onwards not found in its Chinese parallel.[39] As noted earlier, the *Chagatidīpanī* commentary has some passages in common with the *Lokapaññatti* and arranges this material more systematically according to the

[34] Both works, for instance, are mentioned together (nos. 114, 118) in a 1442 CE inscription listing texts held in a newly established royal monastery in Pagan. See Luce and Tin Htway 1976.

[35] For a detailed history of the *Ṣaḍgatikārikā*, see Okano 2018.

[36] Denis 1977 I: xl–xlix; Mus 1939: 33–65.

[37] BnF Pali manuscript 347, *kā* recto. I am grateful to Ujjwal Kumar for providing me with a romanized transcription of the first folios of the manuscript. v. Hinüber 1996: 182 (§394) wrongly states that the commentary attributes the Pali *Chagatidīpanī* to Aśvaghoṣa. Mus (1939: 36) attributes the *Chagatidīpanī* to a 'Saddhammaghosa,' though Denis (1977 I, iv–v) contends (rightly, I think) that the association of 'Saddhammaghosa' with the *Chagatidīpanī* may well stem from a misunderstanding concerning 'Aśvaghoṣa' as the author of the Sanskrit *Ṣaḍgatikārikā*.

[38] Mus 1939: 18–32; Hazlewood 1987.

[39] For a useful comparison of the *Lokapaññatti* and Chinese translation of the *Lokaprajñapti*, see Denis 1977 II: 253–88.

six-*gati* schema. As such, Mus regarded this commentary as continuing and culminating a process of reordering cosmological information that the *Lokapaññatti* started. For Mus, this reorganization marked a movement away from a 'descriptive cosmology' focused on Mount Sineru and its topography towards an 'interpretative' one centered on an ideal moral order.[40]

Early on in the *Lokapaññatti*, the work briefly refers to the story of the monk Abhibhū, a disciple of the former Buddha Sikhī, who gave a sermon in the Brahma realm that was audible across thousands of worlds. Ānanda asks the Buddha how his powers compare and, after some reticence, the Buddha describes his far vaster cosmological reach.[41] The Pali canon also contains the Abhibhū narrative in the *Aruṇavati Sutta*, and we also find an almost identical discourse on how the Buddha's powers compare with Abhibhū's in the *Cūḷanikā Sutta*.[42] In his commentary on the latter, Buddhaghosa retells with new details the backstory about Abhibhū before elaborating on the *sutta*'s cosmological details in relation to the Buddha's power.[43] The use of a composite Abhibhū narrative as a frame story for detailed descriptions of the Buddha's cosmological knowledge continues in the *Jinālaṅkāravaṇṇanā*.[44] In a lengthy opening, it retells the entire Abhibhū narrative from the *Aruṇavati* and *Cūḷanikā Sutta*s and introduces the material as the *Aruṇavatiya Suttanta Desanā*. What follows is an extensive description of the *cakkavāḷa*, Jambudīpa, and five, rather than six, realms of rebirth in the *kāmaloka*.[45]

The reference to this material in the *Jinālaṅkāravaṇṇanā* as a singular teaching connected with the *Aruṇavati Sutta* suggests that it was developing an independent status. This process crystallized in a compilation of cosmological material forming a stand-alone Pali *sutta*, the *Aruṇavati Sūtra*.[46] This anonymous work has circulated mainly within the northern Thai tradition. Its sources identified so far include the *nikāya* commentaries, the *Visuddhimagga*, the *Jinālaṅkāravaṇṇanā*, and possible the *Abhidhānappadīpikā*.[47] Thus, the work dates after

[40] Mus 1939: 33–65, esp. 56–57.

[41] *Lokapaññatti* 4–7.

[42] *Saṃyutta Nikāya* i 154; *Aṅguttara Nikāya* i 226.

[43] *Manorathapūraṇī* ii 336–345. See also *Paṭisambhidāmagga-aṭṭhakathā* iii 663–666.

[44] *Jinālaṅkāravaṇṇanā* 46–49.

[45] *Jinālaṅkāravaṇṇanā* 46–89.

[46] For an edition of the *Aruṇavati Sūtra*, see Saengmani 1980.

[47] Piromnukul 2006.

the late twelfth century but before 1345 since the *Traibhūmikathā* may name it as a source.[48] While manuscripts refer to it as the *Aruṇavati Sūtra*, the work opens with a benedictory verse where its author names it the *Aruṇavatisaṅgaha*. However, the text does adopt *sutta*-like narrative elements. Its structure is also unlike any other in the genre. It begins by calculating the relative power or *bala* of all beings in the universe. It then describes, in turn, the *cakkavāḷa*, the life-spans of divine beings, the universe's destruction and reemergence, Jambudīpa's cities and countries, the hells, Jambudīpa's topography, and the solar and lunar orbits.

The *Aruṇavati Sūtra* thus contains both descriptive and interpretative elements (to adopt Paul Mus's analytical distinction). For instance, it uniquely organizes livings beings in the cosmos around the central idea of the Buddha's power or *bala* (calculated as equivalent to the power of 9,900,000 bodhisattvas in their last birth). However, like the first half of the *Lokapaññatti*, the work focuses on the world's spatial order centered on Mount Sineru as a descriptive framework. It situates its analysis following a discussion of cosmic time, a theme that the *Lokapaññatti* had also given greater prominence when revising the *Lokaprajñapti*.[49] Similarly, time became the primary interpretative lens for analyzing the *cakkavāḷa* in another short Pali *sutta*, the *Mahākappa-lokasaṇṭhāṇa-paññatti*. This Thai work is anonymous and difficult to date, though the *Traibhūmikathā* may refer to it in its list of sources as the 'Mahākappa.'[50] The work combines narrative elements from the commentaries and *Visuddhimagga* to describe the world's destruction and restoration before giving a rich portrait of the physical *cakkavāḷa*.

4. The other three worlds

These new *sutta*s served to fill a perceived gap that had emerged in the Pali canon and lent authority to cosmological knowledge by presenting it as *buddhavacana*. However, in the long run, this aim seems not to have met with complete success in scholarly circles. For instance, monastic bibliographies do not categorize the *Lokapaññatti* as *buddhavacana* and sometimes

[48] Reynolds and Reynolds 1982: 46.

[49] See Denis 1977 II: 285–287.

[50] Reynolds and Reynolds 1982: 46.

speculate on the monk who may have written the text.[51] These new cosmological *sutta*s also served an exegetical purpose in that, like the commentaries, they attempted to reconcile the different ways of seeing the world. However, they differed from the early commentaries in unifying this knowledge in one place, even if the informational synthesis given was often uneven. In a parallel development, other scholar-monks at the time also responded to this need for a unified cosmological system and began composing the first Pali handbooks on the topic.

Unlike the *sutta* texts, these works have explicit authors and continue the cosmological enquiries of the Pali commentarial tradition. For instance, all Pali cosmological handbooks base their studies on Buddhaghosa's three-world model: the worlds of formations (*saṅkhāra*), living beings (*satta*), and space (*okāsa*). In fact, the only manual from this era following the earlier *kāma*, *rūpa*, and *arūpa* three-world schema is the Thai *Traibhūmikathā*. Therefore, structurally, the *Traibhūmikathā* is not as representative of this era's worldview as is often thought. The handbooks weave information from the canon and commentaries into a consistent whole, though they sometimes incorporate material from outside the tradition. This process of compilation began even in the second-millennium subcommentaries. For instance, in Sri Lanka, the twelfth-century scholar Sāriputta compiled from commentarial material a definitive account of the *saṅkhāra*, *satta*, and *okāsa* world schema in his *Sāratthadīpanī*.[52] This practice of compilation eventually resulted in increasingly dense, systematic presentations of traditional cosmology such that it became a bounded knowledge discipline in its own right.

While most cosmological handbooks were composed in Southeast Asia, we find signs of the sub-genre's emergence in the Sri Lankan tradition too. Increasing interest in cosmological matters is evident in the *Anāgatavaṃsa* commentary, the *Jinālaṅkāravaṇṇanā*, and Sāriputta's Vinaya subcommentary, as mentioned.[53] I have speculated elsewhere that this turn was related to a renewed focus on devotional practices, partly as a consequence of prophecies about the Dhamma's decline.[54] However, the closest we get to a cosmological handbook from Sri Lanka

[51] See, for instance, the *Gandhavaṃsa* (62) and *Piṭakat-tō-sa-muiṅ* (Nyunt 2012: 75) on the *Lokapaññatti*.

[52] *Sāratthadīpanī* B[e] I, 239–90.

[53] There is also a long cosmological discourse on the realms of rebirth, according to the *kāma*, *rūpa* and *arūpa* world schema, in the *Upāsakajanālaṅkāra* (ch. 7).

[54] Gornall 2020.

is Siddhattha's late-thirteenth-century *Sārasaṅgaha*.[55] In this work, Siddhattha compiled passages from the canon and commentaries that he deemed essential (*sāra*). While G. P. Malalasekera saw this work as 'jumbled together anyhow, with no attempt at arrangement,' I have argued that the *Sārasaṅgaha* has quite a clear organizational structure.[56] In particular, chapters sixteen to twenty-four describe different types of karma, chapters twenty-five to thirty-four categorize various living beings, and the final six chapters deal with the life-cycle and physical attributes of the universe. These three sections correspond roughly with the *saṅkhāra*, *satta*, and *okāsa* worlds, and Siddhattha uses the terms *satta-* and *okāsaloka* when introducing the latter two.

As Sīhaḷa monastic lineages took hold in Southeast Asia in the second millennium, Sri Lankan scholarship became an essential resource for those in the region writing the first cosmological handbooks. One such work was Medhaṅkara's *Lokadīpakasāra*. According to its colophon, Medhaṅkara wrote the work in Martaban, Burma, during the reign of king Li Thai (Lidaya) of Sukhothai (r. 1347–61). Medhaṅkara also belonged to a Sri Lankan forest-monk lineage and became the *saṅgharāja* (head of the Saṅgha) and preceptor to the king.[57] The *Lokadīpakasāra* consists of eight chapters. The first chapter describes the *saṅkhāraloka*. Chapters two to six cover the *sattaloka* and comprise analyses of the five *gati*s of the *kāmaloka*. Chapter seven gives a detailed account of the *okāsaloka* before a final chapter covers miscellaneous cosmological information. The unusual style of the work — a mix of verse and prose — betrays its composite character. The prose chapter on the *saṅkhāraloka*, for instance, is lifted wholesale from Sāriputta's Vinaya subcommentary.[58] The other mainly prose chapter on the *okāsaloka* too consists of passages from Sāriputta's work, the *Jinālaṅkāravaṇṇanā*, and the *Sārasaṅgaha*.[59] The other chapters are entirely in verse, and their sources are unknown.

The collation of cosmological information in these works, using the *saṅkhāra*, *satta*, and *okāsa* world schema as a framework, led to a more systematically integrated worldview. Scholar-monks strengthened and developed the logical connections between cosmological ideas first

[55] See Sasaki 1992 for an edition of the work.

[56] Malalasekera 1994: 230; Gornall 2020: 123.

[57] *Lokadīpakasāra* 231. See also Griswold and Nagara 1973 and v. Hinüber 1996: 183–4.

[58] Compare *Lokadīpakasāra* 1–9 and *Sāratthadīpanī* B^{e} I, 241–48.

[59] See Phrachatpong 2009.

forged in the commentaries. In doing so, they amplified explanations about how the universe works and how the causal connections between the *saṅkhāra*, *satta*, and *okāsa* worlds condition its change. Another early second-millennium work, the *Lokuppatti*, represents an ideal example of this kind of synthesis. According to its colophon, this treatise on the *saṅkhāra*, *satta*, and *okāsa* worlds was composed by a certain Samantabhaddapaṇḍita. He was a pupil of the Aggamahāpaṇḍita, the 'principal great scholar,' who was also named Samantabhadda.[60] Confusion about the common name shared by both teacher and pupil is likely why the seventeenth-century *Gandhavaṃsa* wrongly ascribes the *Lokuppatti* to an Aggapaṇḍita.[61] Sompong Preechajindawut dates the work to twelfth-century Pagan, and it must have been composed before 1442 as a Pagan inscription of king Narapati (r. 1413–68) mentions it.[62]

As its title suggests, the *Lokuppatti* primarily focuses on the temporal order of the *saṅkhāra*, *satta*, and *okāsa* worlds and how they change over time. Its first half treats the development of each world in turn while also making explanatory connections between these different levels of reality. It begins, for instance, by describing the *saṅkhāraloka* via the *khandha*s, and distinguishes between the *khandha*s of living and non-living things. When it turns to the *sattaloka*, it does not provide a taxonomy of the different realms of living beings like other works. Instead, it focuses on how the concept of a living thing develops from these *khandha*s and how karma determines a living being's birth, life, and death. The work then similarly focuses on the life-cycle of the physical universe and the causal mechanisms that sustain it, including living beings' karma. However, the second half of the *okāsaloka* discussion shifts into a more conventional description of the *cakkavāḷa* with its mountains and continents. Particularly noteworthy is the attention the work gives to the movements of the sun, moon, and constellations, a topic that becomes increasingly important among works in later centuries.

5. The world of space

The greater attention given to the *okāsaloka* in the *Lokuppatti* relative to the *saṅkhāra* and *satta* worlds in some ways pre-empts the final schematic development in Pali cosmological writing.

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[60] *Lokuppatti* 183.

[61] *Gandhavaṃsa* 64.

[62] Luce and Tin Htway 1976.

From the mid-fourteenth century, scholar monks in Southeast Asia continued to write cosmological handbooks based on the *saṅkhāra*, *satta*, and *okāsa* world model. However, instead of focusing on all three worlds, they evoke the schema to isolate the *okāsaloka* as the primary and often only object of analysis. As a result, these works offer an unprecedentedly detailed account of the spatial world but lose some of the systematic, explanatory purpose of earlier works based on the complete three-world model. Moreover, they say little about why they focus primarily on the spatial world, and more work is needed to explain this development.

The largest and most influential work of this era is the *Cakkavāḷadīpanī*. A prolific scholar-monk, Sirimaṅgala, composed the text in Lanna in 1520. According to the work's colophon, he lived in a monastery known in Thai as Suan Khwan (สวนขวัญ) southeast of the Sīhaḷārāma during the reign of Phra Mueang Kaew (r. 1495–1526) (whom he refers to as 'the great-grandson of king Laka,' i.e., Tilokarāja, r. 1441/2–1487).[63] In a recent article on Sirimaṅgala, Gregory Kourilsky addressed the debate about the location of Suan Khwan. He argued that the monastery lay within the city walls of Chiang Mai right next to the Sīhaḷārāma or Phra Singh monastery. The Phra Singh monastery still houses a *Cakkavāḷadīpanī* manuscript that dates to 1538, only eighteen years after the original work was composed. At Suan Khwan, Sirimaṅgala also wrote the *Vessantaradīpanī* (a commentary on the *Vessantara Jātaka*) in 1517 and the *Saṅkhyāpakāsakaṭīkā* (a commentary on a work concerning weights and measures) in 1520.[64]

Scholars have often assumed that Sirimaṅgala belonged to one of the Sīhaḷa monastic lineages that became prominent in Lanna from the late fourteenth century, not least because of his ties to the Sīhaḷārāma in Chiang Mai. Indeed, his *Cakkavāḷadīpanī* reveals a strong influence from works associated with Sīhaḷa lineages, particularly the *Lokadīpakasāra*, *Jinālaṅkāravaṇṇanā*, and the *Sāratthadīpanī*. The *Lokadīpakasāra* is by far the *Cakkavāḷadīpanī*'s most significant source, and its systematic treatment of the *okāsaloka* in its third chapter appears to have formed the blueprint for the arrangement of Sirimaṅgala's work.[65] Like the *Lokadīpakasāra*, the *Cakkavāḷadīpanī* begins with a chapter on the nature of the *cakkavāḷa*, followed by chapters on the world's mountains, its water bodies, and continents. However, the work deviates from the *Lokadīpakasāra* with a spatial treatment of the hells and heavens before ending similarly

[63] *Cakkavāḷadīpanī* VI, 98. See also Saddhātissa 1974: 217.

[64] Kourilsky 2021. Javier Schnake is currently editing the *Saṅkhyāpakāsakaṭīkā*.

[65] Katapunyo 2018.

with a chapter on miscellaneous cosmological issues. Sirimaṅgala's fidelity to the *Lokadīpakasāra* was likely due to more than simply the work's availability, for he had to hand other sources, such as the *Lokapaññatti* and *Lokuppatti*, but generally chose to ignore them.

Another cosmological text from the Thai region related to the *Cakkavāḷadīpanī* in both form and content is the *Lokasaṇṭhānajotaratanagaṇṭhi*. This is the title most commonly used among the extant manuscripts of the work. However, the anonymous author names his composition the *Lokajotikā* at the work's beginning and the *Jotaratanasatthavaṇṇanā* in his final colophon.[66] This cosmological handbook was composed after the *Cakkavāḷadīpanī* but before 1747, the date of the oldest known manuscript.[67] It consists of six chapters. After an initial chapter on time and the *kappa* system, the work turns to an account of the *cakkavāḷa* and Mount Sineru followed by a description of the world's continents and mountain ranges. It departs thematically from the *Cakkavāḷadīpanī* by discussing the lunar and solar orbits in its fourth chapter. However, it concludes similarly with a brief discussion of the realms of rebirth within the *cakkavāḷa* topography and a final chapter on miscellaneous cosmological matters.

The *Lokasaṇṭhānajotaratanagaṇṭhi*'s inclusion of astronomical knowledge within the domain of cosmology has some precedent in several of the works discussed so far, such as the *Lokapaññatti*, *Lokuppatti*, and *Lokadīpakasāra*. However, for the most part, within the Pali tradition, such astronomical matters were peripheral to the main thrust of cosmological enquiry. This fact perhaps adds weight to Randall Collins's general observation on global intellectual history that, before modernity, mathematics and astronomy were hardly ever integrated with other forms of knowledge.[68] A clear example of this from the Theravada tradition comes from thirteenth-century Sri Lanka. There, a Mahāvihāran scholar-monk Anomadassi composed South Asia's first ever astronomical anthology, the *Daivajñakāmadhenu*.[69] However, he wrote the work in Sanskrit and, despite interest in Buddhist cosmological matters at the time, he never attempts to integrate his astronomical knowledge with the Pali tradition he undoubtedly knew.

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[66] *Lokasaṇṭhānajotaratanagaṇṭhi* 74; 254.

[67] Katapunyo 2018: 277.

[68] Collins 2002: 800–856. On how Sanskrit astronomical tradition fits within Collins's theory, see also Minkowski 2002: 496–7.

[69] See the edition of Seelakkhandha 1906. On the use of Sanskrit for astrological and astronomical works in Sri Lanka, see Bechert 1978.

Such a division of intellectual labor became less apparent in Southeast Asian scholarship. The accommodation of astronomical material in works like the *Lokuppatti* led some to write about the *okāsaloka* while focusing systematically on astronomy. The first such work is the *Candasuriyagatidīpanī* or *Candasuriyagativinicchaya*. The work's postscript names the author Tipiṭakamahāthera, 'an expert in the three Vedas,' who was also given the name Uttamaṅga. It states he was a teacher of two famous kings in a certain Tambarā- or Tammara-desa. Elsewhere, the author indicates he wrote his work in Marammadesa or Burma.[70] In his opening and colophon, Uttamaṅga states he used the canon, commentaries, three Vedas, and Sanskrit *jyotiśāstra* as sources. The work must date after the *Sāratthadīpanī*, which it cites, but before 1520 as it is quoted in the *Cakkavāḷadīpanī*.[71] In its opening, Uttamaṅga explicitly criticizes the *Lokuppatti*, apparently for misunderstanding the Vinaya subcommentary (and its astronomical content?). There, he also praises his teacher Udumbara Mahāthera. It is tempting to connect this figure with an Udumbara Mahāsāmi from Martaban, mentioned in Thai chronicles as sending a disciple to Chiang Mai during the reign of king Kuena (r. 1355–85).[72]

Another Pali cosmological work that was perhaps contemporary with the *Candasuriya-gatidīpanī* and that focuses on astronomy is the *Okāsalokadīpanī*. A manuscript of the work I have consulted contains no opening verses or colophon, and it nowhere identifies its author.[73] However, the *Piṭakat-tō-sa-muiṅ* claims that it was composed by a certain Pitu Saṅgharāja.[74] This scholar-monk was named after his village, Pitu, in the Sagaing region of Burma, and was a teacher of the Ava kings Thado Minbya (r. 1345–67) and Mohnyin Thado (r. 1426–39).[75] The *Piṭakat-tō-sa-muiṅ* also attributes to Pitu another longer Pali work, the *Lokadīpanī*, which,

[70] v. Hinüber 1996: 185. I am grateful to Prof. von Hinüber for sending me a transcription of a manuscript of this work by U Bokay. I have also consulted a digitized manuscript in the University of Toronto's Myanmar Manuscript Digital Library (UPT538.3F).

[71] See Kourilsky 2021: 112. I thank Ujjwal Kumar for pointing out some of the work's references to the *Sāratthadīpanī*.

[72] *Jinakālamālī* 84. See also Griswold and Nagara 1973.

[73] The manuscript is held in the Royal Library of Denmark (PA [Camb.] 37 [Tuxen VI]). See also Godakumbura 1983: 53.

[74] Nyunt 2012: 75.

[75] Thant 2017.

according to an available manuscript, concerns the calculation of intercalary months (*adhimāsa*).[76] The *Okāsalokadīpanī* shares several topics with the *Candasuriyagatidīpanī* and describes lunar and solar movements (*gati*), the divisions of the elliptic (*vīthi*), and changes in the moon and sun's light (*āloka*). Both works attempt to reconcile astronomical information transmitted in *jyotiśāstra* with the Pali tradition's *cakkavāḷa* cosmology. The *Okāsalokadīpanī* does this a little more systematically than the *Candasuriyagatidīpanī* and bookends its three chapters on the sky with spatial descriptions of the *cakkavāḷa* and the higher heavenly realms.

6. Conclusion

This short survey of Pali cosmological texts and the schemas they used to analyze the world reveals that this genre of writing is more extensive than thought. The genre includes at least thirteen monolingual Pali texts, including the *Aruṇavati-sūtra* or *-saṅgaha*, *Lokadīpanī*, *Lokasaṇṭhānajotaratanaganṭhi*, *Lokuppatti*, *Mahākappalokasaṇṭhānapaññatti*, and the *Okāsa-lokadīpanī*. I have suggested too that we can differentiate this genre into two sub-types: works that take the form of new *sutta*s, such as the *Aruṇavati Sūtra* and *Lokapaññatti*, and those that condense cosmological information from the commentaries and other sources in the form of scholastic handbooks and anthologies, such as the *Cakkavāḷadīpanī* and *Lokadīpakasāra*.

The worldviews these works disclose also reveal an interesting intellectual trajectory. We can see the scope of cosmological enquiry steadily expanding from the canon's emphasis on subjective experience, to hierarchies of living beings, and, finally, to the order of the spatial world. Like the commentaries, the earliest second-millennium Pali cosmological works mediate between and integrate these different perspectives. The handbooks, in particular, take up Buddhaghosa's more expansive definition of the Buddha's omniscience and use his three-world schema — the *saṅkhāra*, *satta*, and *okāsa- loka*s — as the basis for their analysis. However, from the middle of the fourteenth century the scope of enquiry again narrows in an opposite direction and scholar-monks turned their attention primarily to the spatial world.

[76] The digitized manuscript can be found in the University of Toronto's Myanmar Manuscript Digital Library (UPT509.8). I thank Aleix Ruiz-Falqués for transcribing the work's opening verses and colophon.

Significantly, the ways in which nearly all second-millennium Pali works viewed the universe contrast with the most commonly encountered descriptions of Theravada cosmology in introductory European-language textbooks. There, Theravada cosmology is usually described only in terms of the earlier *kāma*, *rūpa*, and *arūpa* world model. So, it is noteworthy that, while this model remained relevant (especially in the Thai-language *Traiphum* cosmological works) no second-millennium cosmologist writing in Pali used the schema as his main interpretative framework. There is an opportunity, then, through these works and their worldviews to build a much more thorough and accurate understanding of Theravada cosmology and to acknowledge the diverse ways scholar monks in history have made sense of the world around them.

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